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PROPELLANT SURVEILLANCE REPORT LGM-30 F AND G STAGE 1, PHASE E,--ETC(U)
OCT 76 J A THOMPSON

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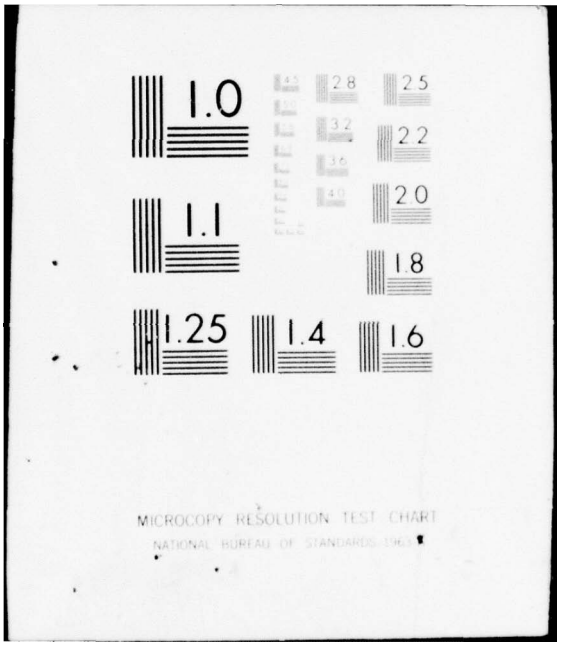
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MICROCOPY RESOLUTION TEST CHART
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HEADQUARTERS

OGDEN AIR LOGISTICS CENTER

UNITED STATES AIR FORCE

HILL AIR FORCE BASE, UTAH 84406

PROPELLANT SURVEILLANCE REPORT LGM-30 F&G STAGE 1 PHASE E, SERIES II TP-H1011

PROPELLANT LABORATORY SECTION

MANCP REPORT

360 (76)

NOVEMBER 1976

MANCP REPORT NR 360 (76)
MMEMP PROJECT M72632-5MP116P

PROPELLANT SURVEILLANCE REPORT
LGM-30 F & G STAGE I (TP-H1011)

Author

JOHN A. THOMPSON, Chemist
Component & Combustion Test Unit

Engineering & Statistical Review By

JOHN K. SCAMBIA, Project Engineer
Service Engineering

EDWARD J. ERICKSON, Statistician
Data Analysis Unit

Recommended Approval By

LEONIDAS A. BROWN, Chief
Component & Combustion Test Unit

Approved By

DON F. WOODS, Chief
Propellant Laboratory Section

NOV 1976

Industrial Products & Ldg Gear Division
Directorate of Maintenance
Ogden Air Logistics Center
United States Air Force
Hill Air Force Base, Utah 84406

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ABSTRACT

This report contains propellant test results from cartons of TP-H1011 bulk propellant representing LGM-30 F and G First Stage Minuteman Motors. This report uses a statistical approach to analyze the bulk carton propellant data. Testing was accomplished in accordance with MMEMP Project M72632-5MP116P.

The data from this test period are combined with data from previous testing and entered into the G085 computer for storage, analysis and regression analysis. From the statistical analysis of all data tested to date (11 and one half years for F and G), significant degradation of the propellant does not appear likely for at least two years past the oldest data point.

Each point on the regression plot represents the mean of all samples at that particular age. The number of samples at each point is indicated on the sample size summary sheet on the page accompanying each regression plot or group of regression plots. The data range at any age can be found by suitable inquiry of the G085 system.

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LIST OF REFERENCES

Report Nr	Title	Report Date
	LGM-30 First Stage, Wing I Test Reports	
29A	Test Report (Missile in silo)	13 Jan 64
29B	Zero Time Test Results	29 Jan 64
29C	Zero Time Test Results (Supplement 1)	30 Mar 64
29D	Zero Time Test Results (Aft Closure)	9 Jun 64
29E	Zero Time (Aft Closure Supplement 1)	24 Jun 64
29F	ATP Phase I Test Results	30 Mar 65
29G	ATP Phase I Test Results	19 Aug 65
29H	ATP Phase I Test Results	10 Sep 65
32A	Zero Time, Wings II-V Test Results	17 Mar 65
32B	Zero Time, Wings II-V Test Results (Aft Closure)	18 Mar 65
32C	ATP Phase I, Wings II-V Test Results	3 Nov 65
49	ATP Phase I, Wings II-V (First Group)	18 Mar 66
53	ATP Phase I, Wings II-V (Second Group)	22 Apr 66
55	ATP Phase I, Wings II-V (Third Group)	29 Apr 66
58	ATP Phase I, Wings II-V (Fourth Group)	6 May 66
61	ATP Phase I, Wings II-V (Fifth Group)	10 Jun 66
66	ATP Phase I, Wings II-V (Sixth Group)	22 Jul 66
76	ATP Phase II, Wing I Test Results	24 Jan 67
78	Zero Time, Wing VI Test Results	3 Feb 67
104	ATP Phase I, Wing VI (First Group	12 Oct 67
118	ATP Phase II, Wings II-V (First Group)	5 Mar 68

LIST OF REFERENCES (CONT)

Report Nr	Title	Report Date
126	ATP Phase II, Wings II-V (Second Group)	11 Apr 68
130	ATP Phase II, Wings II-V (Third Group)	3 May 68
162	ATP Phase I, Wing VI (Second Group)	30 Sep 69
176	ATP Phase II, Wing VI (First Group)	15 Apr 70
181	ATP Phase III, Wing I	7 May 70
185	ATP Phase I, Wing VI (Third Group)	22 Jun 70
195	ATP Phase III, Wings II-V (Retest)	29 Oct 70
223	Surveillance Report LGM-30 Stage I (TP-H1011)	Sep 71
239	Surveillance Report LGM-30 Stage I (TP-H1011 and TP-H1043)	Apr 72
258	Surveillance Report LGM-30 A & B Stage I (TP-H1011)	Nov 72
268	Surveillance Report LGM-30 A & B Stage I (TP-H1011)	May 73
271	Surveillance Report LGM-30 F & G Stage I Phase A Series II, (TP-H1011)	Jul 73
277	Surveillance Report LGM-30 F & G Stage I Phase A Series III, (TP-H1011)	Oct 73
280	Surveillance Report LGM-30 A & B Stage I (TP-H1011)	Nov 73
288	Propellant Surveillance Report LGM-30 A & B, Stage I, TP-H1043	Mar 74
290	Propellant Surveillance Report LGM-30 F & G, Stage I, Phase B, Series I TP-H1011	Mar 74
300	Minuteman Stage I Motor Reliability Improvement Program Surveillance	May 74

LIST OF REFERENCES (CONT)

Report Nr	Title	Report Date
302	Propellant Surveillance Report LGM-30 A & B Stage 1, TP-H1011	Nov 74
313	Stage 1 Propellant Surveillance Report, Propellant Containing Glacial Acrylic Acid	Oct 74
315	Propellant Surveillance Report LGM-30 F & G Stage 1, TP-H1011	Jan 75
316	Propellant Surveillance Report LGM-30 A & B Stage 1, TP-H1011	Feb 75
319	Propellant Surveillance Report LGM-30 Dissected Motors, Phase VI, TP-H1011	Apr 75
321	Propellant Surveillance Report LGM-30 F & G Stage 1, Phase B, Series II, TP-H1011	Apr 75
325	Propellant Surveillance Report LGM-30 A & B Stage 1, TP-H1011	Jun 75
328	Propellant Surveillance Report LGM-30 A & B Stage 1, TP-H1011	Sep 75
330	Propellant Surveillance Report LGM-30 F & G Stage 1, TP-H1011	Oct 75
335	Stage 1 Motor Reliability Improvement Program	Dec 75
337	Propellant Surveillance Report LGM-30 A & B, Stage 1, TP-H1043	Feb 76
339	Stage 1, New MAPO & ERL-510 Qualification	Mar 76
341	Propellant Surveillance Report LGM-30 Dissected Motors, Phase VII, TP-H1011	Mar 76

LIST OF REFERENCES (CONT)

Report Nr	Title	Report Date
343	Propellant Surveillance Report LGM-30 A & B, Stage 1, TP-H1011	Jun 76
345	Propellant Surveillance Report LGM-30 F & G, Stage 1 Phase B, Series III, TP-H1011	Jun 76
350	Qualification of a New MAPO Source and ERL-510 Curing Agent for Minuteman, Stage 1, UF-2121 Liner	Sep 76
351	Propellant Surveillance Report LGM-30 A & B, Stage 1, TP-H1011	Sep 76
354	Minuteman Stage 1 Motor Reliability Improvement Program Surveillance	Sep 76

GLOSSARY OF TERMS AND ABBREVIATIONS

Aging Trend	A change in properties or performance resulting from aging of material or component
CSA	Cross Sectional Area
DB	Dogbone
Degradation	Gradual deterioration of properties or performance
E	Modulus (psi), defined as stress divided by strain along the initial linear portion of the curve.
EB	End Bonded
EGL	Effective Gage Length
em	Strain at maximum stress
er	Strain at rupture
"F" ratio	The ratio of the variance accounted for by the regression function to the random unexplained variance. The regression function having the most significant "F" ratio is used for plotting data. The ratio is also used in detecting significant changes in random variation between succeeding time points
JANNAF	Joint Army, Navy, NASA, Air Force Committee
MANCP	Propellant Lab Section at Ogden Air Logistics Center
Ogden ALC	Ogden Air Logistics Center, Air Force Logistics Command
r or R	The Correlation Coefficient is a measure of the degree of closeness of the linear relationship between two variables
Regression Equation	The general form of the regression equation is $Y = a + bx$
Regression Line	Line representing mean test values with respect to time
S_b	Standard error of estimate of the regression coefficient

S_e or $S_{Y.X}$	Standard deviation of the data about the regression line
Sm	Maximum Stress
Sr	Stress at rupture
Standard Deviation (S_y)	Square root of variance
Strain Rate	Crosshead speed divided by the EGL
"t" test	A statistical test used to detect significant differences between a measured parameter and an expected value of the parameter (determines if regression slope differs from zero at the 95% confidence level)
Variance	The sum of squares of deviations of the test results from the mean of the series after division by one less than the total number of test results
3 Sigma Band	The area between the upper and lower 3 sigma limit. It can be expected that 99.73% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed.
90-90 Band	It can be stated with 90% confidence that 90% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed

INTRODUCTION

A. PURPOSE:

Laboratory testing has been performed for eleven and one-half years on First Stage LGM-30 F and G Minuteman Motor propellant blocks to evaluate the effects of aging on TP-H1011 propellant. This report contains those tests conducted on propellant as instructed in MMEMP Test Directive GTD-1C, Amendment 2, LGM-30 First Stage Operational Propellant Laboratory Testing.

Statistical analysis of the data from tests performed will provide early warning if serious degradation trends develop. Annual evaluation of the propellant provides data for input into engineering reliability analysis for service life predictions.

B. BACKGROUND:

LGM-30 F and G testing was started in 1966 with phase testing at 24 month intervals (Report Numbers 78 - zero time; 104, 162, 185-Phase I, 176, 239, 257-Phase I, 271-Phase III). Report Number 257 was the first time that LGM-30 F and G data were statistically analyzed separately from LGM-30A and B data. The present report is a continuation of testing and statistical analysis.

Zero time testing for LGM-30A, B, F and G was started as soon as possible after receipt of the propellant by MANCP. Data from these tests were used to establish a base line for each test parameter.

The LGM-30F and G propellant test matrix (Table 1) is used to determine the number of specimens to be taken from each propellant loaf and the specific test or tests to which these specimens are to be subjected. Very low rate and low rate tensile specimens are taken on all LGM-30F and G blocks. Specimens for other physical and combustion tests are taken from every third (LGM-30F and G) block.

TABLE 1

SAMPLE PLAN

The Procedure for determining tests to be performed on propellant batch samples of LGM-30 F & G First Stage Motors are as follows:

1. Divide the USAF motor serial numbers into three groups by dividing the last three digits of each serial number by three to determine the remainder integer, e.g., 154 ÷ 3 = 51 with a remainder integer of 1.

2. Use the remainder integer to enter the following matrix to determine the group of tests to be performed on the forward, middle, and aft batch samples associated with a particular motor serial number.

GROUP MATRIX

TP-H1011 PROPELLANT BATCH SAMPLE	GROUP I	GROUP II	GROUP III
Forward	1	2	0
Middle	0	1	2
Aft	2	0	1

Each group will receive the following tests:

TEST MATRIX

GROUP I	GROUP II	GROUP III
High Rate Triaxial	Dynamic Response	High Rate Hydrostatic
Creep	Stress Relaxation	Sol Gel
Biaxial Low Rate	Burning Rate	DSC
TCLE	Heat of Explosion	TGA
Hardness	Pressure Time	DTA
Ignitability		Impact

NOTE: Low Rate and Very Low Rate Tensile tests are performed on all blocks.

STATISTICAL APPROACH

In order to determine aging trends for shelf/service life predictions, as directed by Service Engineering, First Stage LGM-30 F and G Minuteman Motor propellant blocks have been under-going testing since 1966, statistically analyzed and reported on a regular test cycle by this laboratory.

The primary reason for performing statistical analysis on test data is for the detection of propellant changes due to aging that would affect motor reliability. The method of analysis called regression was used to examine data and to draw meaningful conclusions about dependency relationships that may exist i.e., relationship between age versus test results.

In selecting the best fit model for the regression equation, six models were fitted to the data (see regression models at the end of this statistical approach). The linear model $Y = a + bX$ was found to be the best fit model for the regressions in this report 93% of the time. By using the best fit model, the regression line becomes a more accurate predictor of future trends. The model used is shown in the regression equation at the top of every regression plot and those which are not linear will also be listed and discussed in the test results section.

Individual data points from different time periods were used to establish a least squares trend line for the data. The variance about the regression line, obtained using individual values of the dependent variable, was used to compute a tolerance interval such that at the 90% confidence level 90% of the sample distribution falls within this interval. This tolerance interval was extrapolated to a maximum of 24 months into the future from age of the oldest motor tested. The 't' values and the

significance of this statistic, which are reported for each regression model, give an indication of the "statistical significance" of the slope of the trend line as compared to a line of zero slope. Data were plotted by computer. The 'y' axis is computed so that the values at one inch intervals are peculiar to the data spread of the parameter tested. Plotted data points represent means at the particular ages at which testing occured. The number of specimens at each age point is indicated on the sample size summary sheet accompanying the regression plot. Variance at each test age can be determined by consulting the G085 data storage system.

A comparison of the slopes of the regression trend lines and their Y - axis intercepts found in the regression equation was performed. Of the tests common to this test period and the last test performed (MANCP Report Nr 345 (76), the following observations were made: There has been an average increase of 21% in the number of total samples tested. 54.29% of the aging trend lines have become flatter or closer to a line of zero slope which indicates less change due to age, 34.28% of the aging trend lines show more change although the changes are gradual and no operational problems are expected at this time; and 11.43% of the aging trend lines show no change from the last test period.

As the number of samples tested and age of samples is increased, the over all aging trend is becoming closer to a line of zero slope showing less effect due to aging.

A post cure effect (propellant stabilizing after the first year or two) has been observed on some of the early test data (Stress Relaxation at -65°F, -40°F, and 20°F; DTA Exotherm 1, Exotherm 2; and Dynamic Response)

which tended to bias and skew the projected trend lines. To overcome this factor, two methods of analysis were performed: First, where possible, non-linear models were used that would best fit the total data (DTA Exotherm 1 and Exotherm 2 data; Dynamic Response data); second, where non-linear models did not fit the data, this early data was eliminated (Stress Relaxation at -60°F, -40°F, and 20°F data). By compensating for this post cure biasing a more accurate aging trend line for service life prediction is provided.

REGRESSION MODELS

Reciprocal of X	$Y = a + b\ (1/X)$
Natural log of X	$Y = a + b\ (\mathrm{LN}\ X)$
LOG to the base 10 of X	$Y = a + b\ (\mathrm{LOG}\ X)$
Square Root of X	$Y = a + b\ \sqrt[2]{X}$
Cube Root of X	$Y = a + b\ \sqrt[3]{X}$
Linear equation	$Y = a + bX$

TEST RESULTS

VERY LOW RATE TENSILE (0.002 in/in/min):

The very low rate tensile data shows a statistically significant decrease for strains and an increase for stresses and modulus. The trends are gradual for the respective curves and no problems are indicated for at least two years after the last test date (Figures 1 thru 5).

LOW RATE BIAXIAL TENSILE:

A statistically significant gradual decrease is shown for strains and a statistically significant gradual increase for stresses and modulus (Figures 6 thru 10).

LOW RATE TENSILE:

Low rate tensile data shows a statistically significant gradual decrease for strains and a gradual increase for stresses and modulus (Figures 11 thru 15).

HIGH RATE TRIAXIAL:

The strains show a statistically significant decrease, the stresses a statistically significant increase and modulus shows no change (Figures 16 thru 20). All changes are gradual and no problems are indicated.

HIGH RATE HYDROSTATIC:

The strains show a statistically significant gradual decrease with the stresses and modulus showing a statistically significant gradual increase (Figures 21 thru 25).

TENSILE SUMMARY:

The test data shows that the strain is gradually decreasing and the stress is gradually increasing for Wing Six propellant. Therefore, based on the analyses of data from the tensile test parameters, it does not appear that meaningful degradation is occuring at this time and no operational problems are expected for at least two years beyond the last data point.

STRESS RELAXATION MODULUS:

For the 0.5% strains at -65°F, a statistically significant gradual increase is shown (Figures 26 thru 29). There is a statistically significant gradual decrease (for the 0.5% strain at -40°F), except for the 10 second regression which shows no trend (Figures 30 thru 33).

The 3% strain at 20°F, 77°F, 100°F, 140°F and 180°F shows either a statistically significant gradual increase or no change (Figures 34 thru 53). An exception is shown at 20°F, 10 seconds which shows a statistically significant gradual decrease (Figure 34).

CONSTANT STRAIN:

A statistically significant gradual decrease is shown. This correlates well with the tensile testing and stress relaxation modulus which indicates that the propellant polymer continues to cross link. It should be noted that the constant strain starts at 10% strain and is increased at 5% increments. As seen by the regression, a large proportion of the specimens broke at the 25% strain level. This breaking at the 25% level is particularly apparent from about 7 years to the latest data points (Figure 54).

DYNAMIC RESPONSE:

The storage shear modulus at 200 and 400 Hz shows a statistically significant increase (Figures 55 thru 58). The best statistical models found are reciprocal of X for storage shear and the natural log of X for loss tangent. The changes are gradual and no operational problems are indicated.

HARDNESS:

Shore A ten second hardness data shows a statistically significant gradual increase (Figure 59). The hardness, stress relaxation, constant strain and dynamic response all correlate well with the tensile testing. As in the tensile testing, the statistically significant changes shown by the above tests are gradual and no operational problems are expected for at least two years beyond the last test data date.

BURNING RATE:

The burning rate shows a statistically significant gradual decrease (Figure 60).

PRESSURE TIME:

Maximum pressure shows no change from a zero slope while time to maximum pressure shows a statistically significant gradual decrease (Figures 61 and 62).

IGNITABILITY:

Ignitability shows no significant change (Figure 63).

TCLE:

The thermal coefficient of linear expansion for both below and above Tg (glass point) show a statistically significant gradual increase (Figures 64 and 65).

SOL GEL:

The gel swell ratio and percent extractables show no significant changes, cross link density and density show a statistically significant gradual increase (Figures 66 thru 69).

TGA:

The ignition temperature and percent weight loss at ignition show a statistically significant gradual increase. The percent weight loss at 250°C hold is not changing significantly at this time (Figures 70 thru 72).

DTA:

The endotherm does not show a significant change. The first and second exotherm show a statistically significant gradual decrease and their fit model is LOG to the base 10 of X. The third exotherm and the ignition temperature show a statistically significant gradual increase (Figures 73 thru 77).

TEAR ENERGY:

No significant change is shown in the regression (Figure 78).

DSC:

A statistically significant decrease is shown for the endotherm, first exotherm peak, and second exotherm peak (Figures 79 thru 81). The changes are gradual and no operational problems are expected in the propellant.

CONCLUSIONS

Eleven and one-half years of aging at ambient temperature (77°F) has not greatly changed the properties of the propellant. Some test parameters indicate slight aging trends, but nothing that would adversely affect the operational characteristics of the rocket motor propellant.

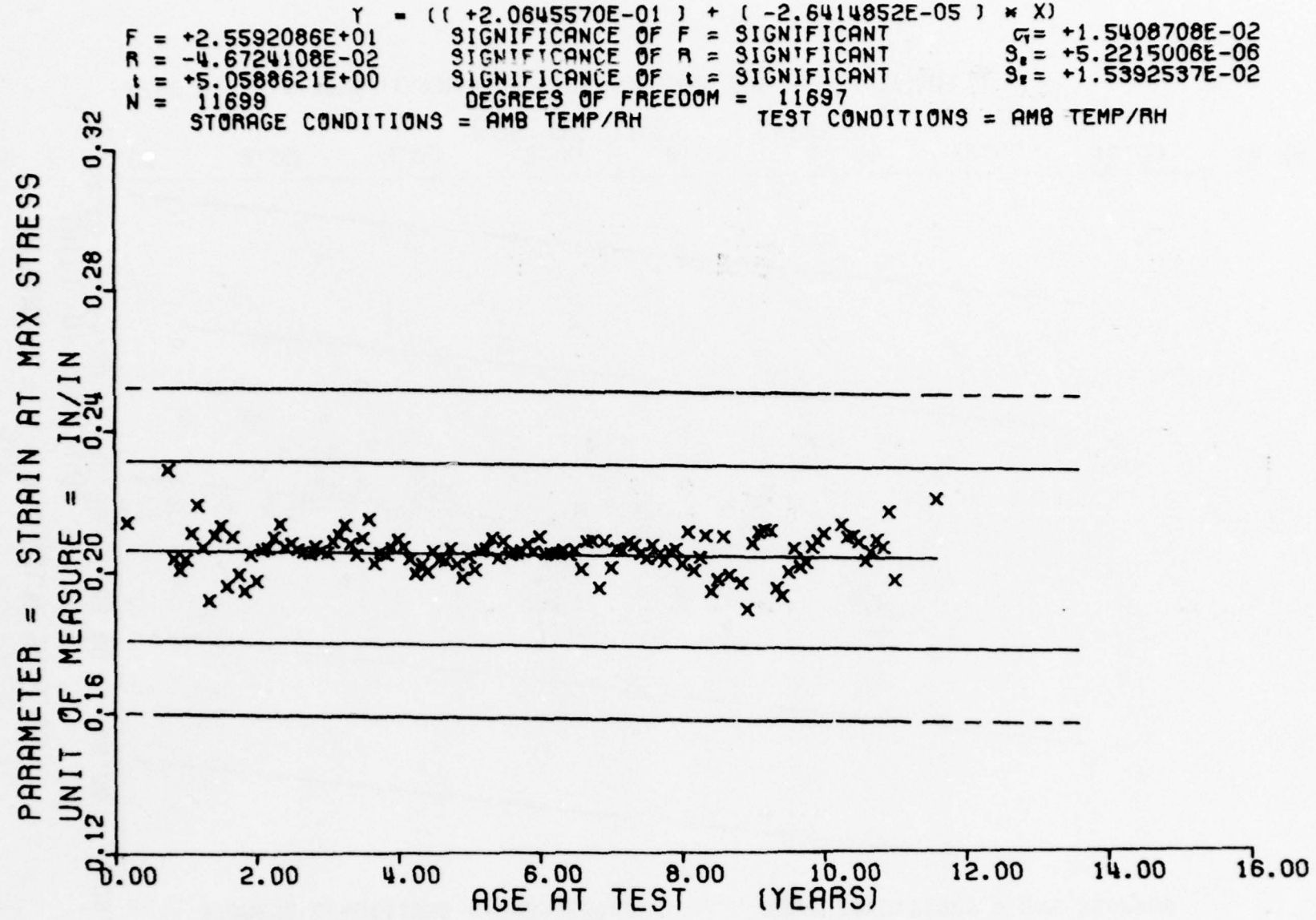
From the statistical analysis it does not appear that significant propellant degradation is occurring. Based on the eleven and one-half years of accumulated data, there is no reason to suspect that properties will show much change for at least two years past the last data point. Therefore, propellant reliability should not change appreciably over that time period. Since failure limits are not available for the parameters tested, this statement is based on the fact that the slope of the regression curves where statistically significant are, with few exceptions, relatively flat or close to a line of zero slope and have not changed appreciably from the last test period.

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
2.0	1	33.0	122	58.0	253	83.0	42	109.0	96
9.0	10	34.0	136	59.0	299	84.0	26	110.0	42
10.0	5	35.0	89	60.0	403	85.0	30	111.0	21
11.0	15	36.0	195	61.0	245	86.0	61	112.0	100
12.0	15	37.0	126	62.0	300	87.0	104	113.0	223
13.0	30	38.0	108	63.0	232	88.0	120	114.0	70
14.0	10	39.0	93	64.0	115	89.0	130	115.0	62
15.0	32	40.0	110	65.0	87	90.0	114	116.0	171
16.0	25	41.0	141	66.0	61	91.0	62	117.0	82
17.0	55	42.0	117	67.0	23	92.0	49	118.0	95
18.0	25	43.0	142	68.0	96	93.0	78	119.0	121
19.0	37	44.0	100	69.0	165	94.0	51	120.0	24
20.0	18	45.0	135	70.0	203	95.0	55	123.0	39
21.0	50	46.0	116	71.0	114	96.0	77	124.0	27
22.0	12	47.0	148	72.0	92	97.0	48	125.0	66
23.0	46	48.0	138	73.0	62	98.0	21	126.0	44
24.0	49	49.0	151	74.0	125	99.0	36	127.0	92
25.0	36	50.0	126	75.0	138	100.0	16	128.0	51
26.0	47	51.0	316	76.0	105	101.0	60	129.0	24
27.0	44	52.0	298	77.0	130	102.0	12	130.0	28
28.0	51	53.0	256	78.0	27	103.0	37	131.0	15
29.0	37	54.0	226	79.0	71	104.0	45	132.0	3
30.0	61	55.0	387	80.0	50	106.0	5	139.0	3
31.0	76	56.0	382	81.0	78	107.0	10		
32.0	129	57.0	303	82.0	57	108.0	63		

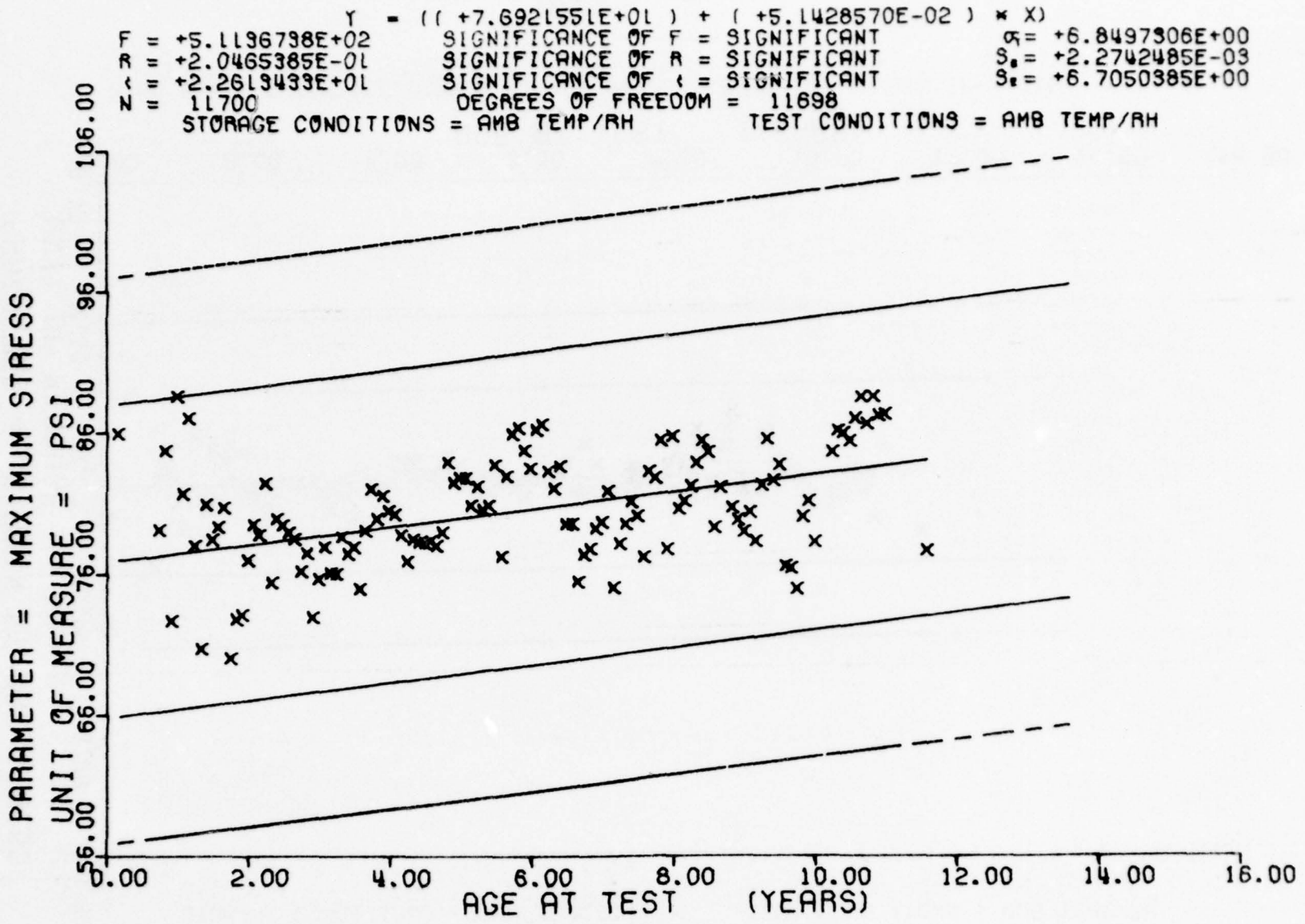
WING 6.V.L.R.TENSILE. .CHS=C.002 IN/MIN TP-H1011

This sample size summary is applicable for figures 1 thru 5.



WING 6,V.L.R.TENSILE,STRAIN AT MAX STRESS,CHS=0.002 IN/MIN TP-H1011

Figure 1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σ = +6.8497306E+00
R = +2.0465385E-01
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S = +2.2742485E-03
ε = +2.2619433E+01
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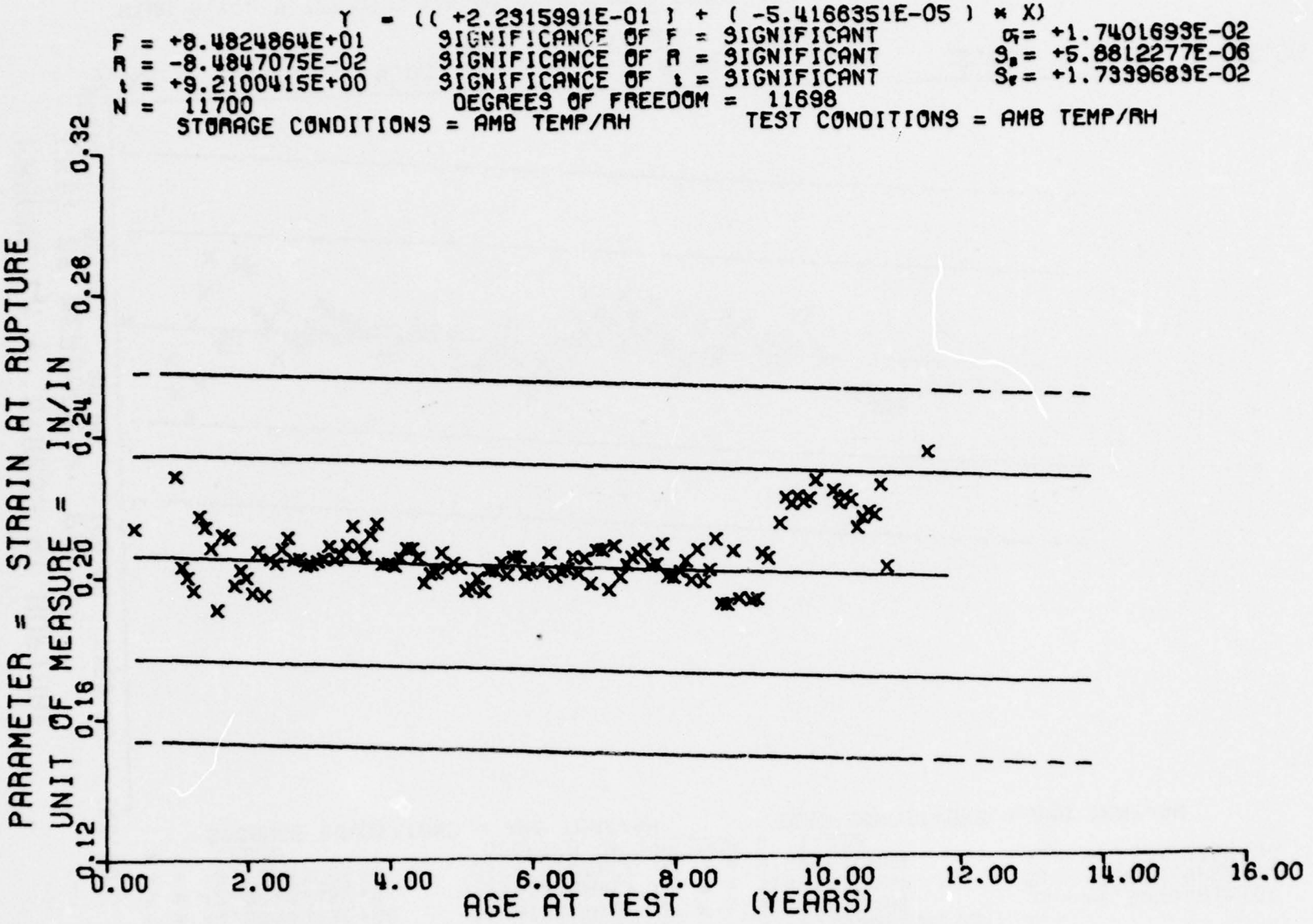
S = +6.7050385E+00
N = 11700
DEGREES OF FREEDOM = 11698
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
106.00
96.00
86.00
76.00
66.00
56.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,V.L.R.TENSILE,MAXIMUM STRESS,CHS=0.002 IN/MIN TP-H1011

Figure 2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R = -8.4847075E-02 SIGNIFICANCE OF R = SIGNIFICANT S_a = +5.8812277E-06
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N = 11700 DEGREES OF FREEDOM = 11698
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PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
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0.20
0.16
0.12
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
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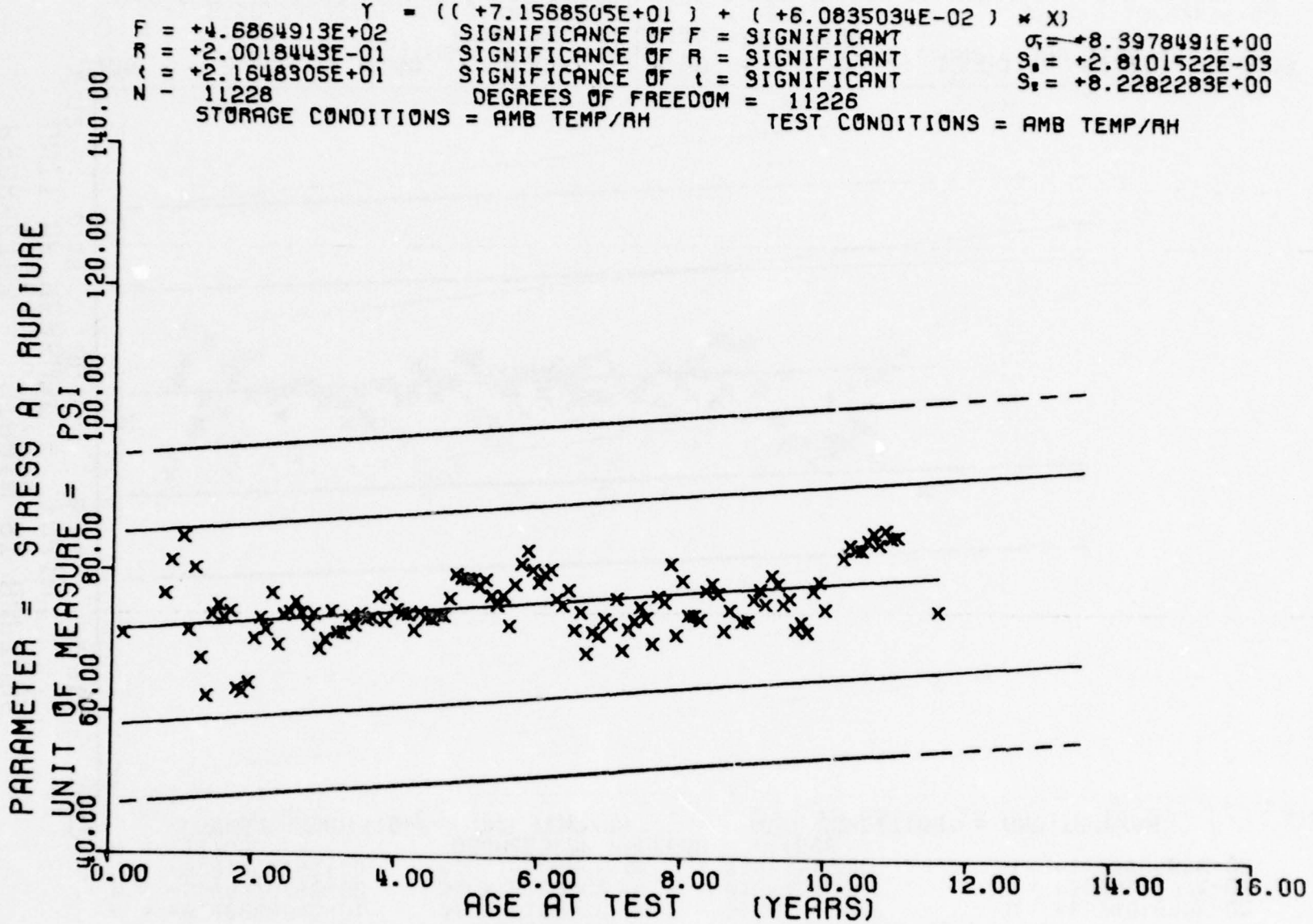
AGE AT TEST (YEARS)
WING 6,V.L.R.TENSILE,STRAIN AT RUPTURE,CHS=0.002 IN/MIN TP-H1011

Figure 3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DEGREES OF FREEDOM = 11226
σ = +8.3978491E+00
S_B = +2.8101522E-03
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TEST CONDITIONS = AMB TEMP/RH
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UNIT OF MEASURE = PSI
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60.00
80.00
100.00
120.00
140.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6.V.L.R.TENSILE.STRESS AT RUPTURE.CHS=0.002 IN/MIN TP-H1011

Figure 4

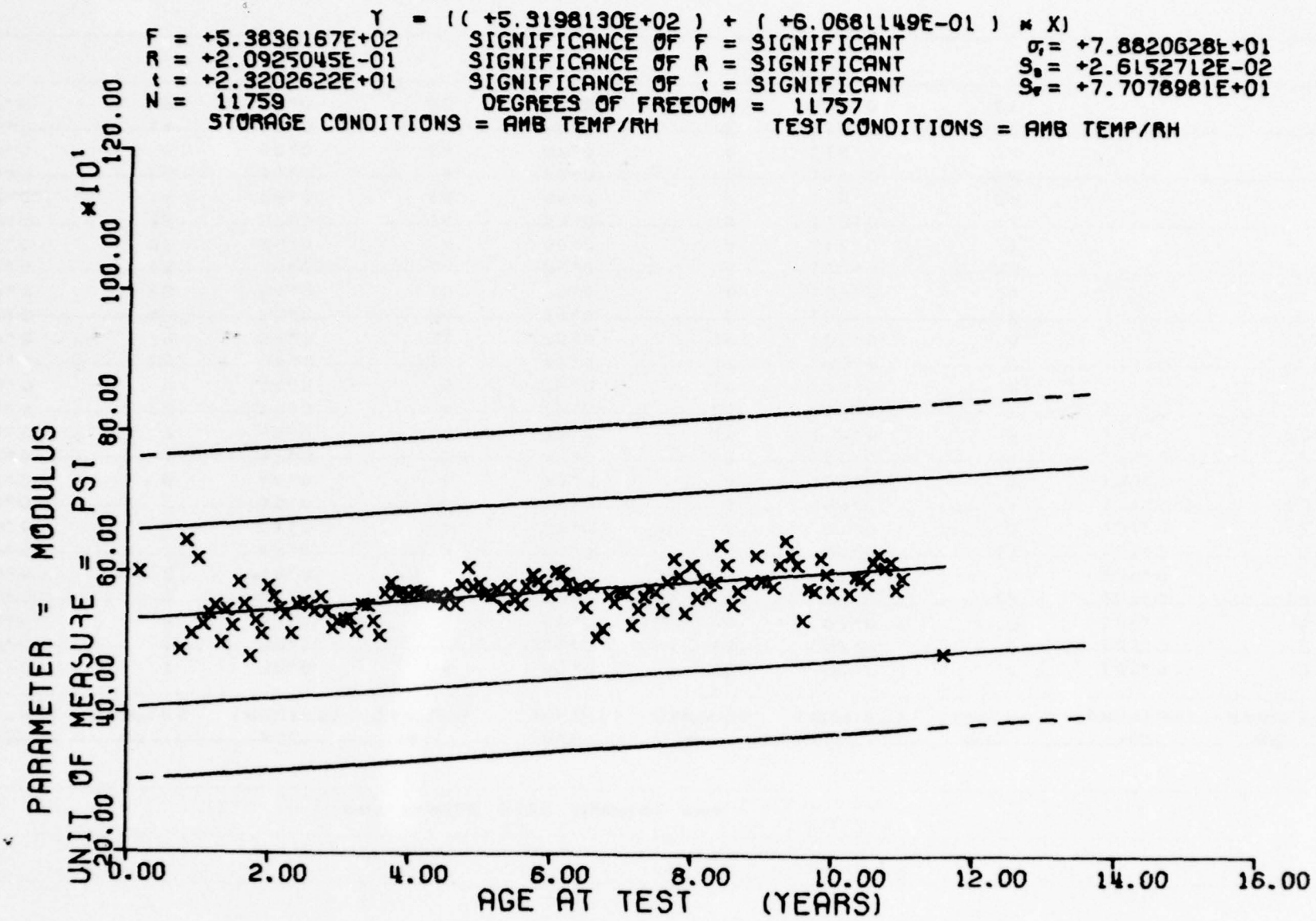

Y = ((+5.3198130E+02) + (+6.0681149E-01) * X)
F = +5.3836167E+02
SIGNIFICANCE OF F = SIGNIFICANT
σ = +7.8820628E+01
R = +2.0925045E-01
SIGNIFICANCE OF R = SIGNIFICANT
S = +2.6152712E-02
t = +2.3202622E+01
SIGNIFICANCE OF t = SIGNIFICANT
S = +7.7078981E+01
N = 11759
DEGREES OF FREEDOM = 11757
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10¹
120.00
100.00
80.00
60.00
40.00
20.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,V.L.R.TENSILE,MODULUS,CHS=0.002 IN/MIN TP HLOLL

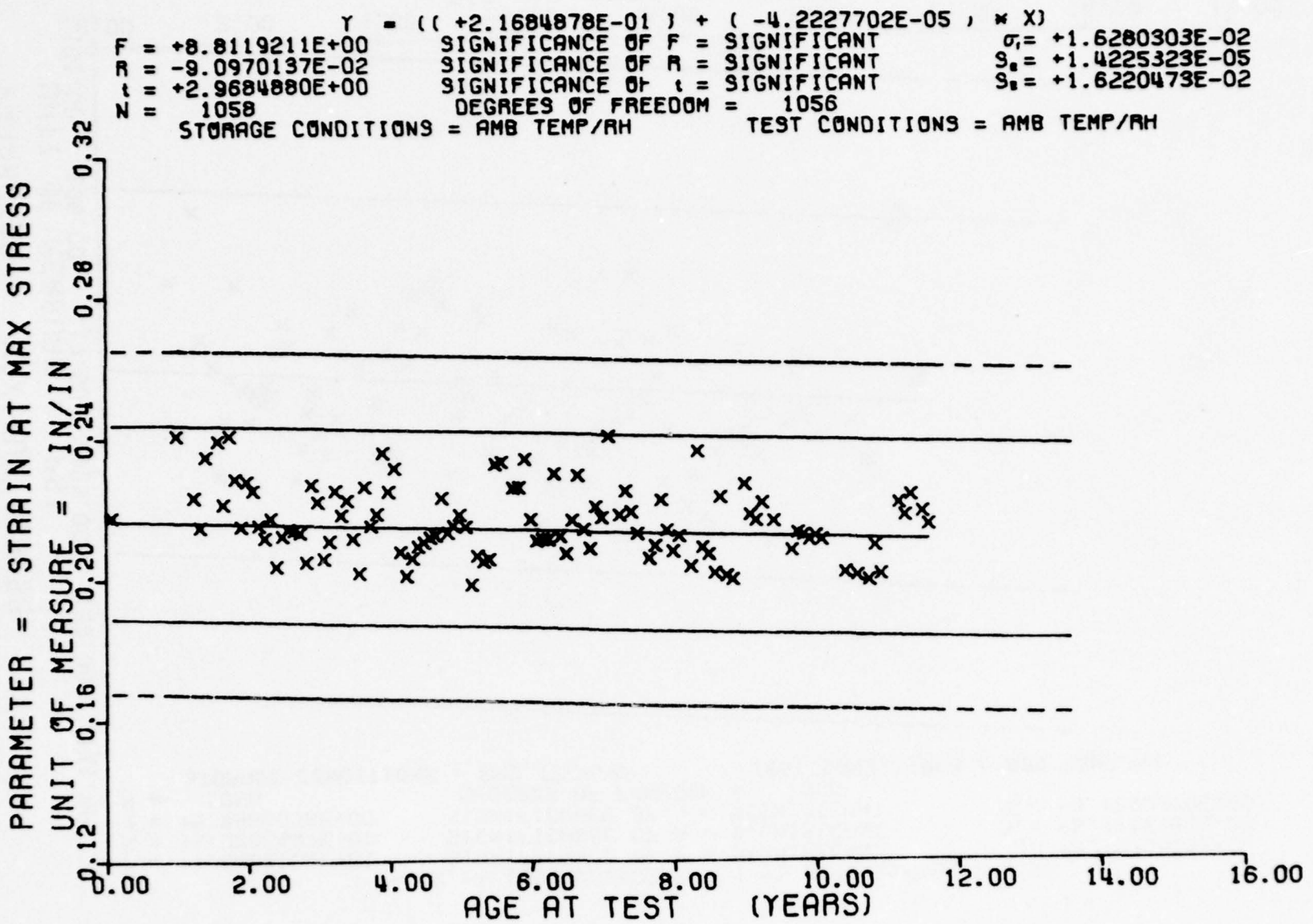
Figure 5

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
1.0	1	38.0	4	63.0	28	90.0	6	121.0	2
12.0	2	39.0	6	64.0	16	92.0	6	123.0	2
13.0	2	40.0	8	65.0	6	93.0	8	125.0	4
15.0	4	41.0	4	66.0	7	94.0	12	127.0	10
16.0	2	42.0	4	67.0	6	95.0	18	129.0	4
17.0	7	43.0	2	69.0	4	96.0	10	130.0	4
19.0	4	44.0	2	70.0	6	97.0	8	131.0	2
20.0	2	45.0	4	71.0	4	99.0	4	134.0	13
21.0	6	46.0	6	72.0	4	100.0	2	135.0	4
22.0	4	47.0	2	73.0	12	101.0	4	136.0	2
23.0	7	48.0	4	74.0	16	102.0	6	138.0	20
24.0	12	49.0	4	75.0	23	103.0	2	139.0	22
25.0	9	50.0	6	76.0	10	104.0	2		
26.0	16	51.0	28	77.0	17	105.0	2		
27.0	8	52.0	31	78.0	16	106.0	4		
28.0	18	53.0	24	79.0	6	108.0	2		
29.0	13	54.0	12	80.0	6	109.0	20		
30.0	18	55.0	14	81.0	6	110.0	23		
31.0	22	56.0	8	82.0	4	111.0	4		
32.0	32	57.0	14	83.0	10	113.0	2		
33.0	14	58.0	10	84.0	2	116.0	34		
34.0	16	59.0	8	85.0	2	117.0	26		
35.0	6	60.0	14	87.0	4	118.0	14		
36.0	14	61.0	8	88.0	2	119.0	30		
37.0	2	62.0	28	89.0	2	120.0	14		

WING 6.L.P.BIAXIAL TENSILE. .CHS=0.2 IN/MIN TPH=1011

This sample size summary is applicable for figures 6 thru 10.



WING 6,L.R.BIAXIAL TENSILE,STRAIN AT MAX STRESS,CHS=0.2 IN/MIN TPH-1011

Figure 6

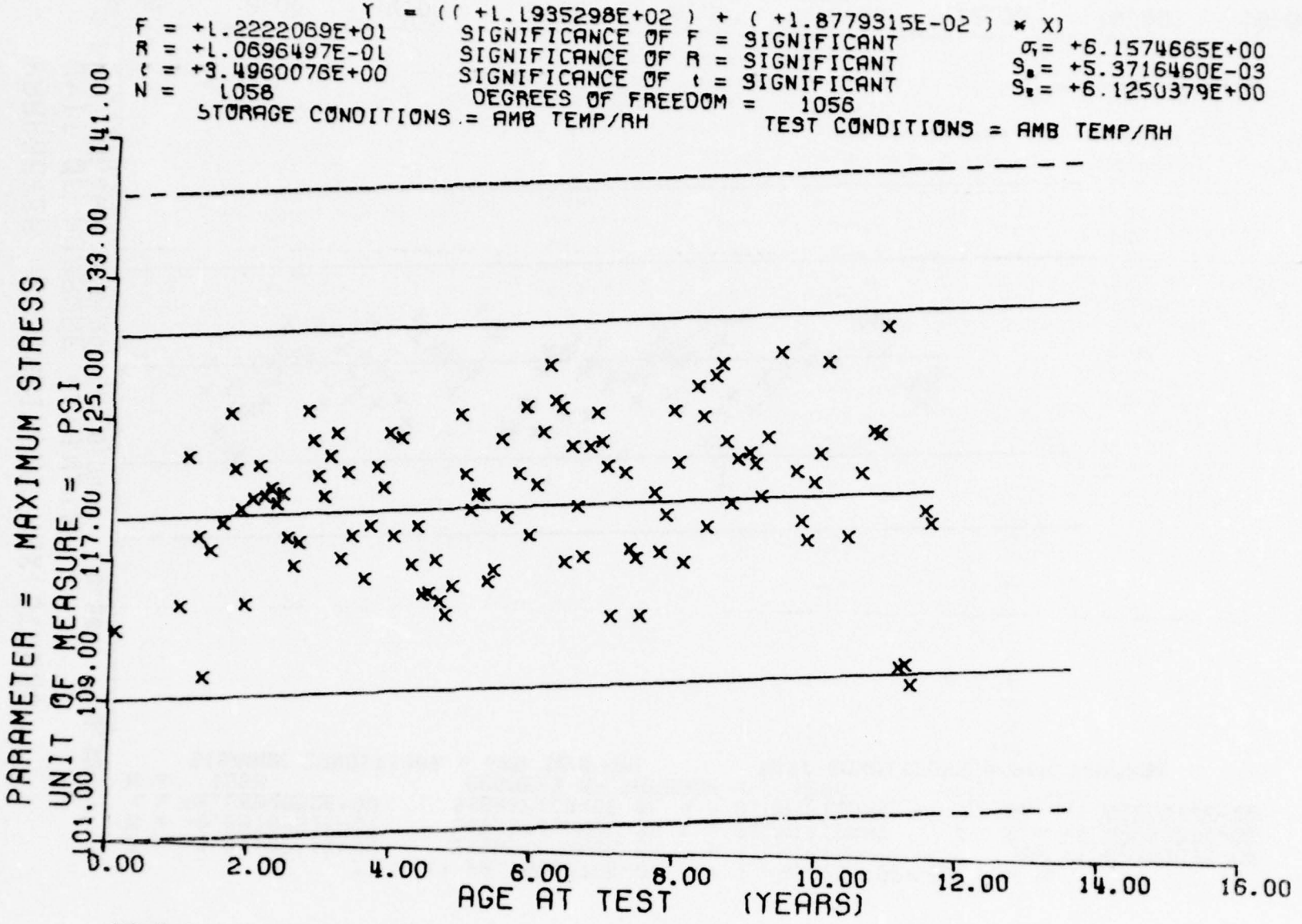

Y = ((+1.1935298E+02) + (+1.8779315E-02) * X)
F = +1.2222069E+01
R = +1.0696497E-01
t = +3.4960076E+00
N = 1058
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 1056
σ = +6.1574665E+00
Se = +5.3716460E-03
Sx = +6.1250379E+00
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
101.00
109.00
117.00
125.00
133.00
141.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6.L.R.BIAXIAL TENSILE.MAXIMUM STRESS.CHS=0.2 IN/MIN TPH-1011

Figure 7

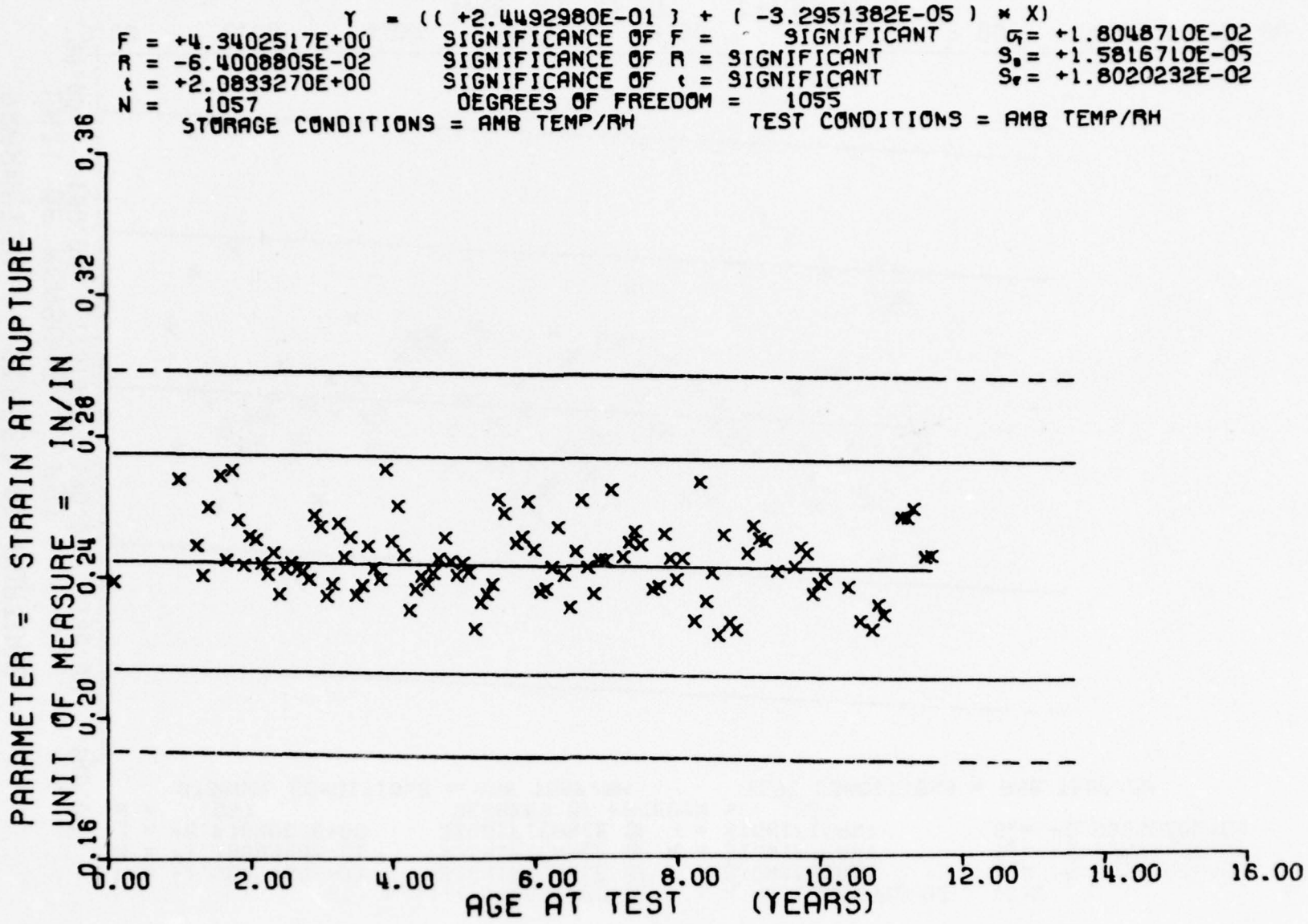
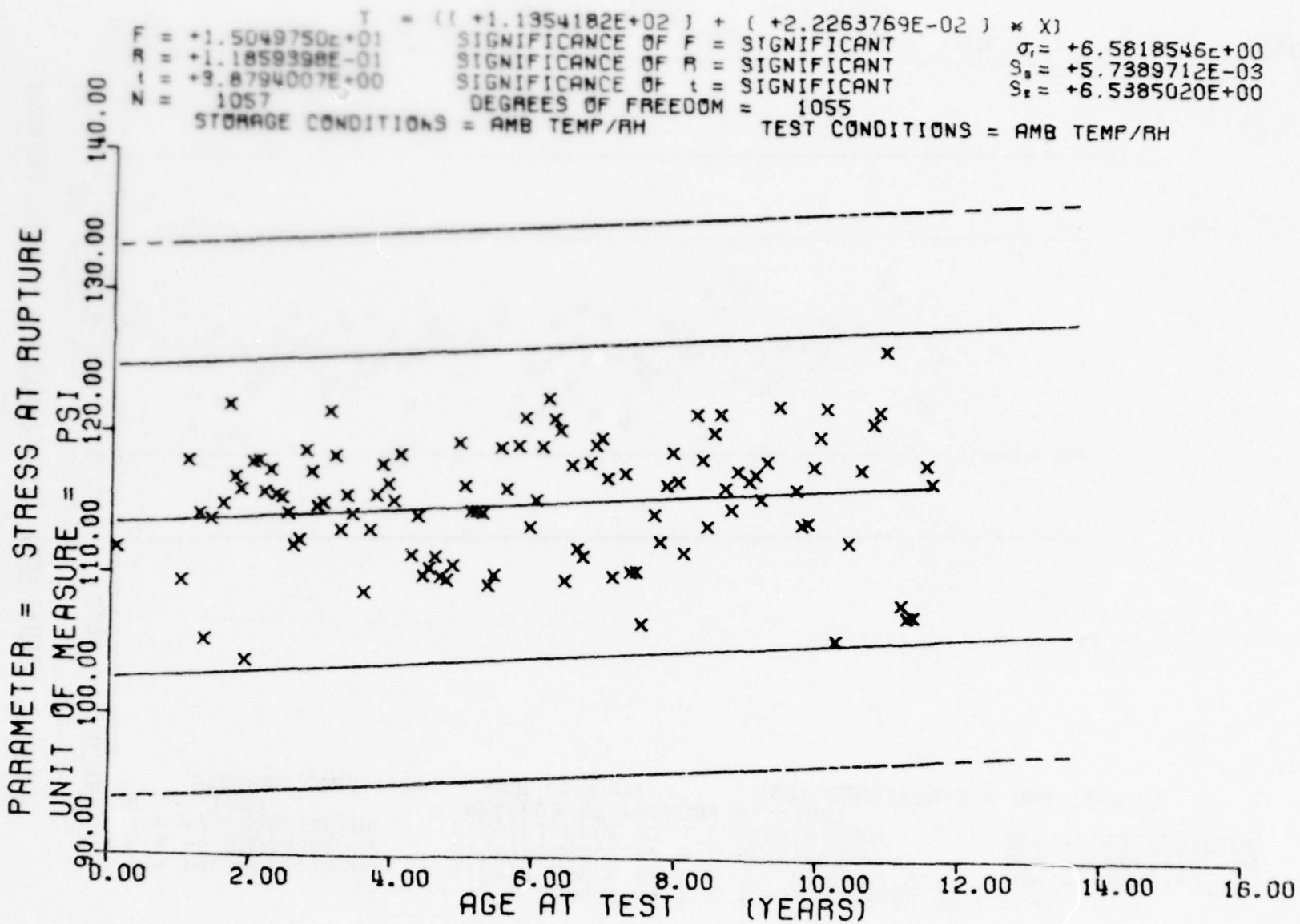
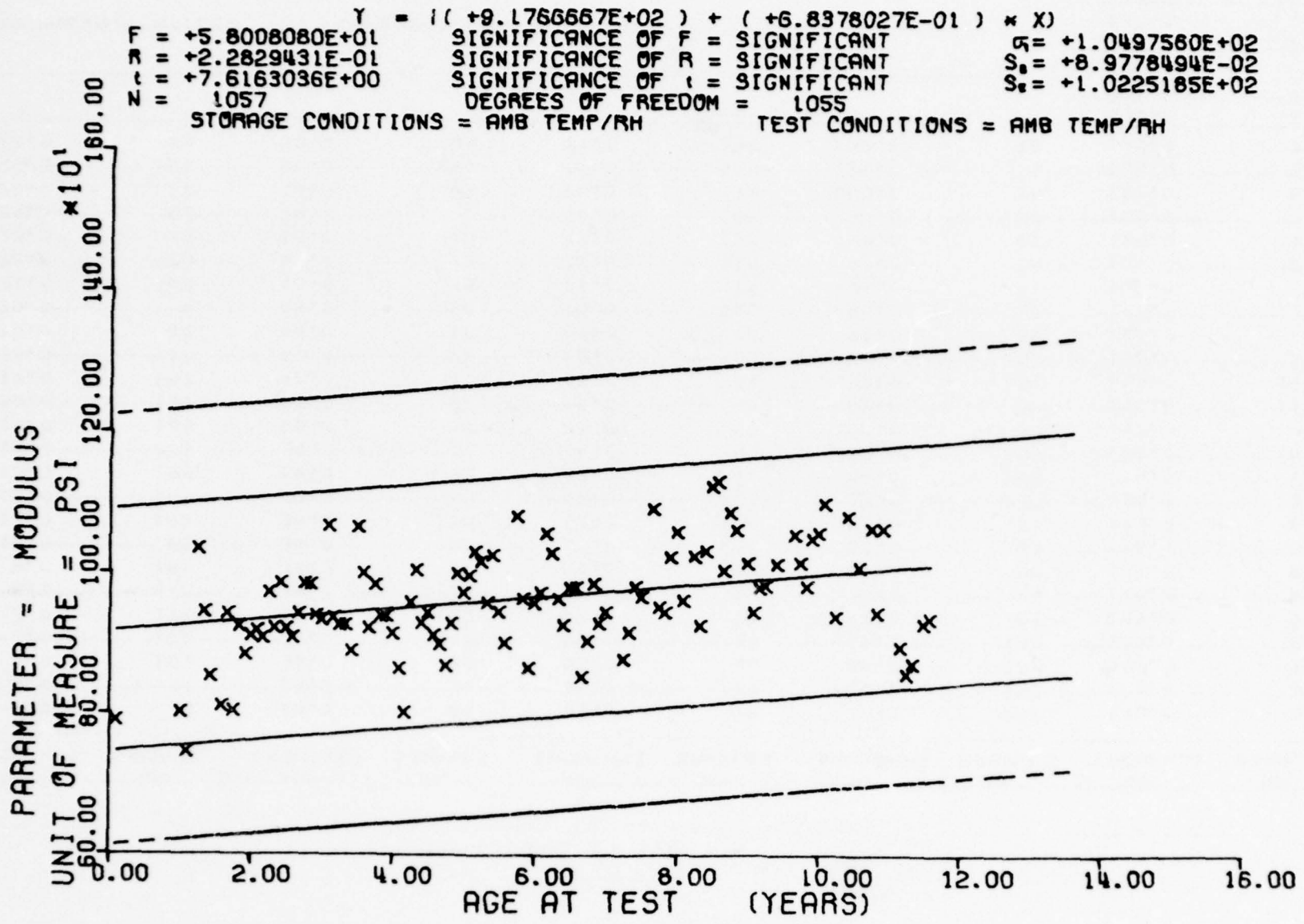

Y = ((+2.4492980E-01) + (-3.2951382E-05) * X)
F = +4.3402517E+00
R = -6.4008805E-02
t = +2.0833270E+00
N = 1057
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 1055
σ = +1.8048710E-02
S = +1.5816710E-05
S = +1.8020232E-02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.36
0.32
0.28
0.24
0.20
0.16
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.BIAXIAL TENSILE,STRAIN AT RUPTURE,CHS=0.2 IN/MIN TPH-1011

Figure 8



WING 6,L.R.BIAXIAL TENSILE,STRESS AT RUPTURE,CHS=0.2 IN/MIN TPH-1011

Figure 9



WING 6,L.R.BIAXIAL TENSILE,MODULUS,CHS=0.2 IN/MIN TPH-1011

Figure 10

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
2.0	3	28.0	64	53.0	76	78.0	147	103.0	35
4.0	57	29.0	34	54.0	77	79.0	102	104.0	45
5.0	151	30.0	46	55.0	55	80.0	105	107.0	15
6.0	191	31.0	43	56.0	34	81.0	109	108.0	66
7.0	171	32.0	103	57.0	73	82.0	57	109.0	93
8.0	140	33.0	73	58.0	62	83.0	79	110.0	41
9.0	185	34.0	54	59.0	87	84.0	30	111.0	21
10.0	183	35.0	32	60.0	105	85.0	30	112.0	53
11.0	192	36.0	118	61.0	150	86.0	36	113.0	67
12.0	199	37.0	65	62.0	185	87.0	135	114.0	35
13.0	195	38.0	25	63.0	244	88.0	114	115.0	15
14.0	201	39.0	60	64.0	89	89.0	107	116.0	180
15.0	185	40.0	50	65.0	58	90.0	60	117.0	96
16.0	197	41.0	20	66.0	40	91.0	55	118.0	117
17.0	157	42.0	60	67.0	54	92.0	53	119.0	117
18.0	18	43.0	75	68.0	50	93.0	61	120.0	33
19.0	40	44.0	15	69.0	70	94.0	65	121.0	9
20.0	4	45.0	20	70.0	120	95.0	50	122.0	12
21.0	60	46.0	55	71.0	72	96.0	71	123.0	30
22.0	25	47.0	79	72.0	119	97.0	56	124.0	21
23.0	30	48.0	40	73.0	120	98.0	25	125.0	42
24.0	62	49.0	77	74.0	154	99.0	20	126.0	72
25.0	27	50.0	93	75.0	175	100.0	18	127.0	57
26.0	56	51.0	154	76.0	123	101.0	61	128.0	33
27.0	38	52.0	196	77.0	145	102.0	10	129.0	30
								130.0	18
								134.0	72
								135.0	9
								136.0	15
								137.0	12
								138.0	120
								139.0	102
								169.0	3

WING 6.L.R.TENSILE. .CHS=2.0 IN/MIN TP-H1011

This sample size summary is applicable for figures 11 thru 15.

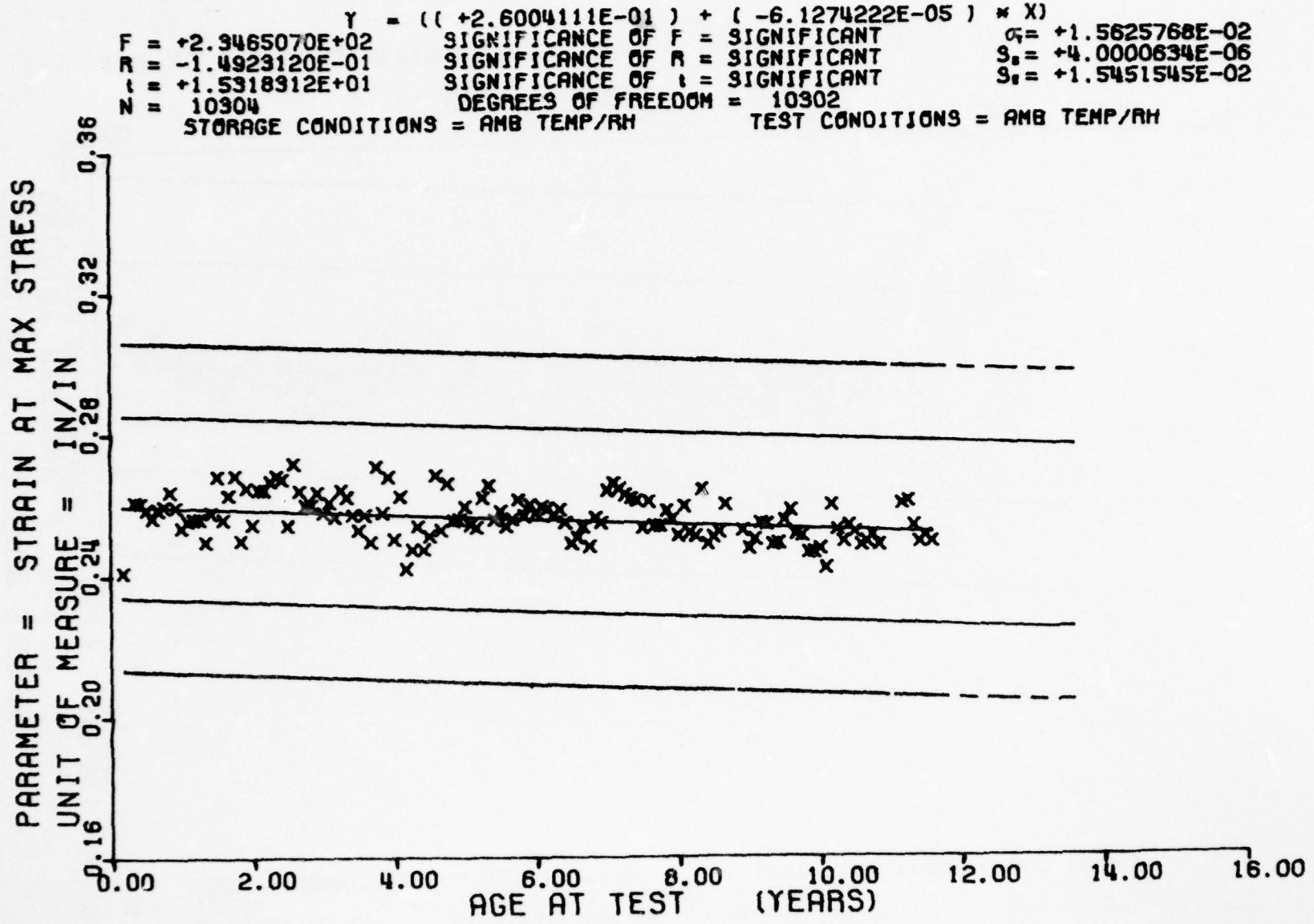

Y = ((+2.6004111E-01) + (-6.1274222E-05) * X)
F = +2.3465070E+02 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.5625768E-02
R = -1.4923120E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +4.0000634E-06
t = +1.5318312E+01 SIGNIFICANCE OF t = SIGNIFICANT S = +1.5451545E-02
N = 10304 DEGREES OF FREEDOM = 10302
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.16
0.20
0.24
0.28
0.32
0.36
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,STRAIN AT MAX STRESS,CHS=2.0 IN/MIN TP-H1011

Figure 11

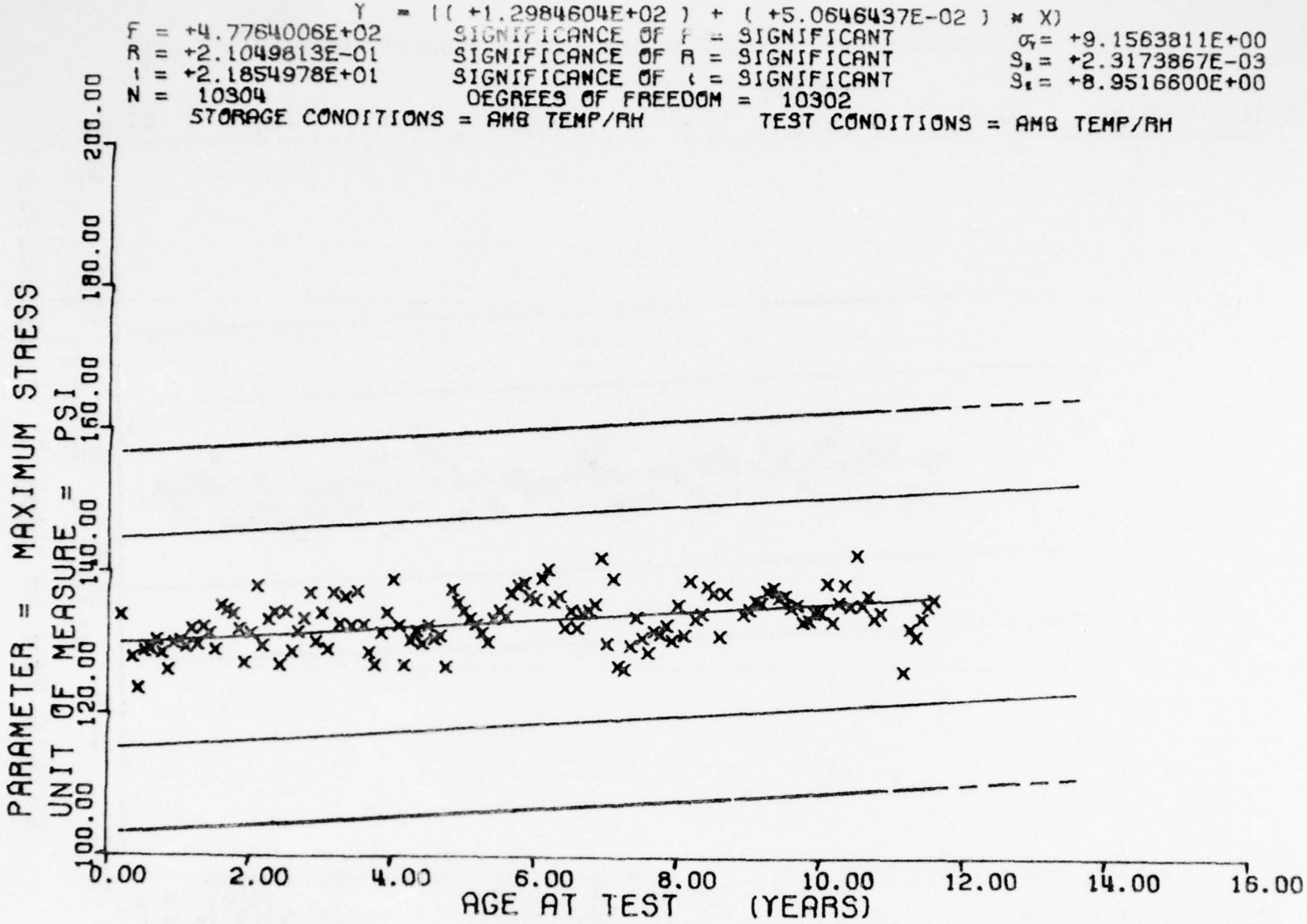

Y = ((+1.2984604E+02) + (+5.0646437E-02) * X)
F = +4.7764006E+02 SIGNIFICANCE OF F = SIGNIFICANT
R = +2.1049813E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.1854978E+01 SIGNIFICANCE OF t = SIGNIFICANT
N = 10304 DEGREES OF FREEDOM = 10302
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
100.00
120.00
140.00
160.00
180.00
200.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,MAXIMUM STRESS,CHS=2.0 IN/MIN TP-H1011

Figure 12

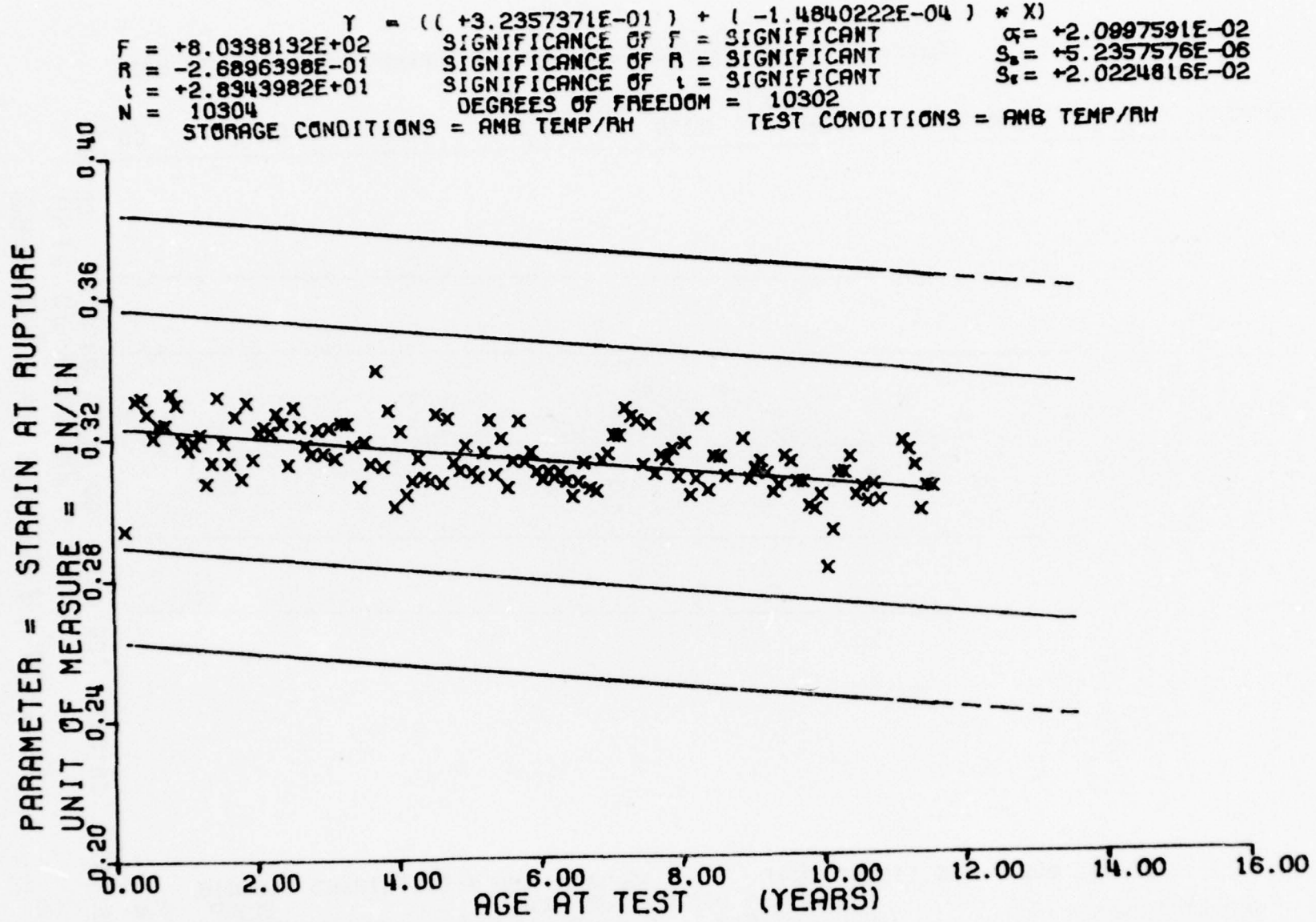

Y = ((+3.2357371E-01) + (-1.4840222E-04) * X)
F = +8.0338132E+02
R = -2.6896398E-01
t = +2.8943982E+01
N = 10304
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 10302
σ = +2.0997591E-02
S_a = +5.2357576E-06
S_ε = +2.0224816E-02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.40
0.36
0.32
0.28
0.24
0.20
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,STRAIN AT RUPTURE,CHS=2.0 IN/MIN TP-H1011

Figure 13

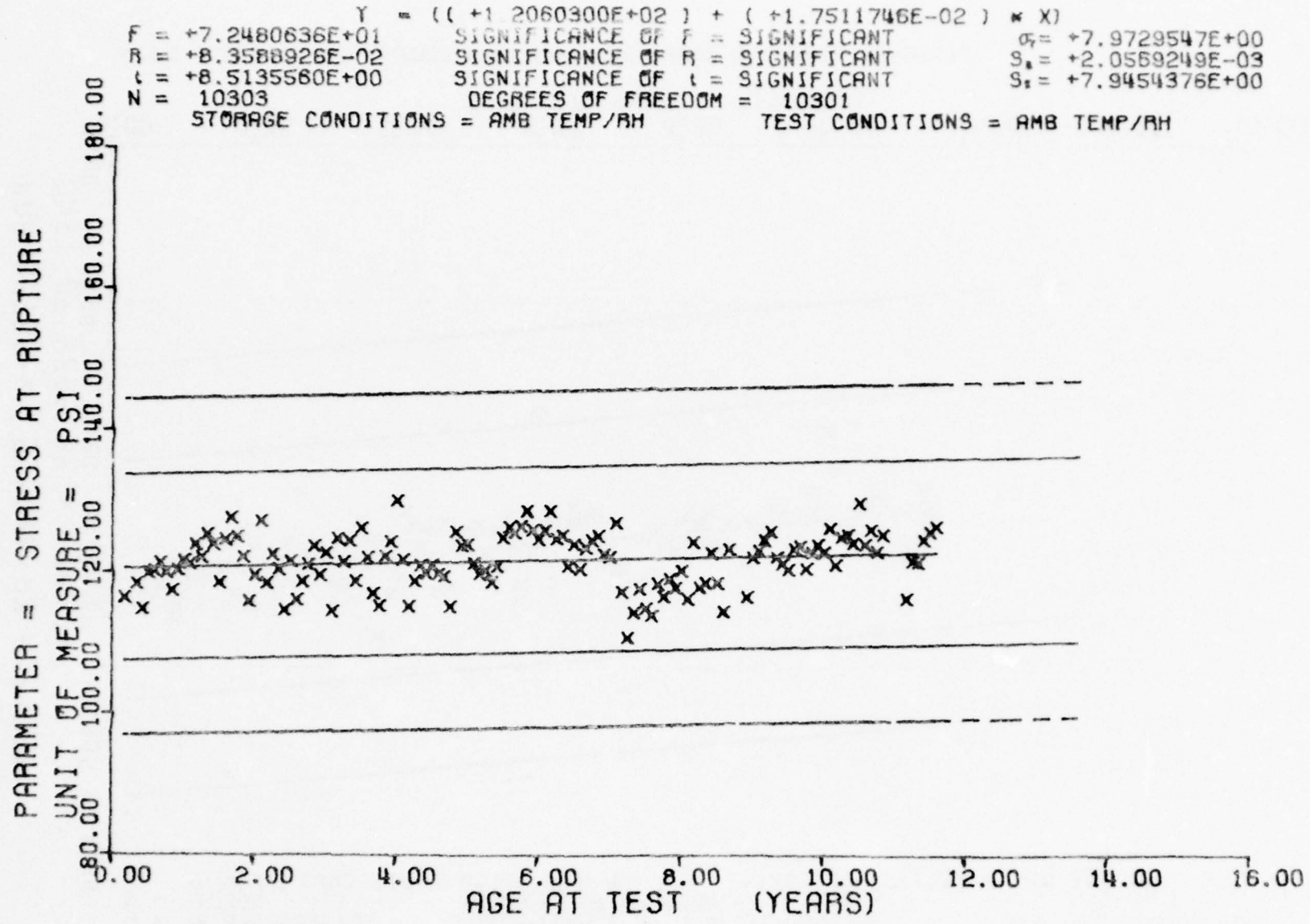

Y = ((+1.2060300E+02) + (+1.7511746E-02) * X)
F = +7.2480636E+01 SIGNIFICANCE OF F = SIGNIFICANT σy = +7.9729547E+00
R = +8.3588926E-02 SIGNIFICANCE OF R = SIGNIFICANT Sa = +2.0569249E-03
t = +8.5135560E+00 SIGNIFICANCE OF t = SIGNIFICANT Sx = +7.9454376E+00
N = 10303 DEGREES OF FREEDOM = 10301
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI
180.00
160.00
140.00
120.00
100.00
80.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,STRESS AT RUPTURE,CHS=2.0 IN/MIN TP-H1011

Figure 14

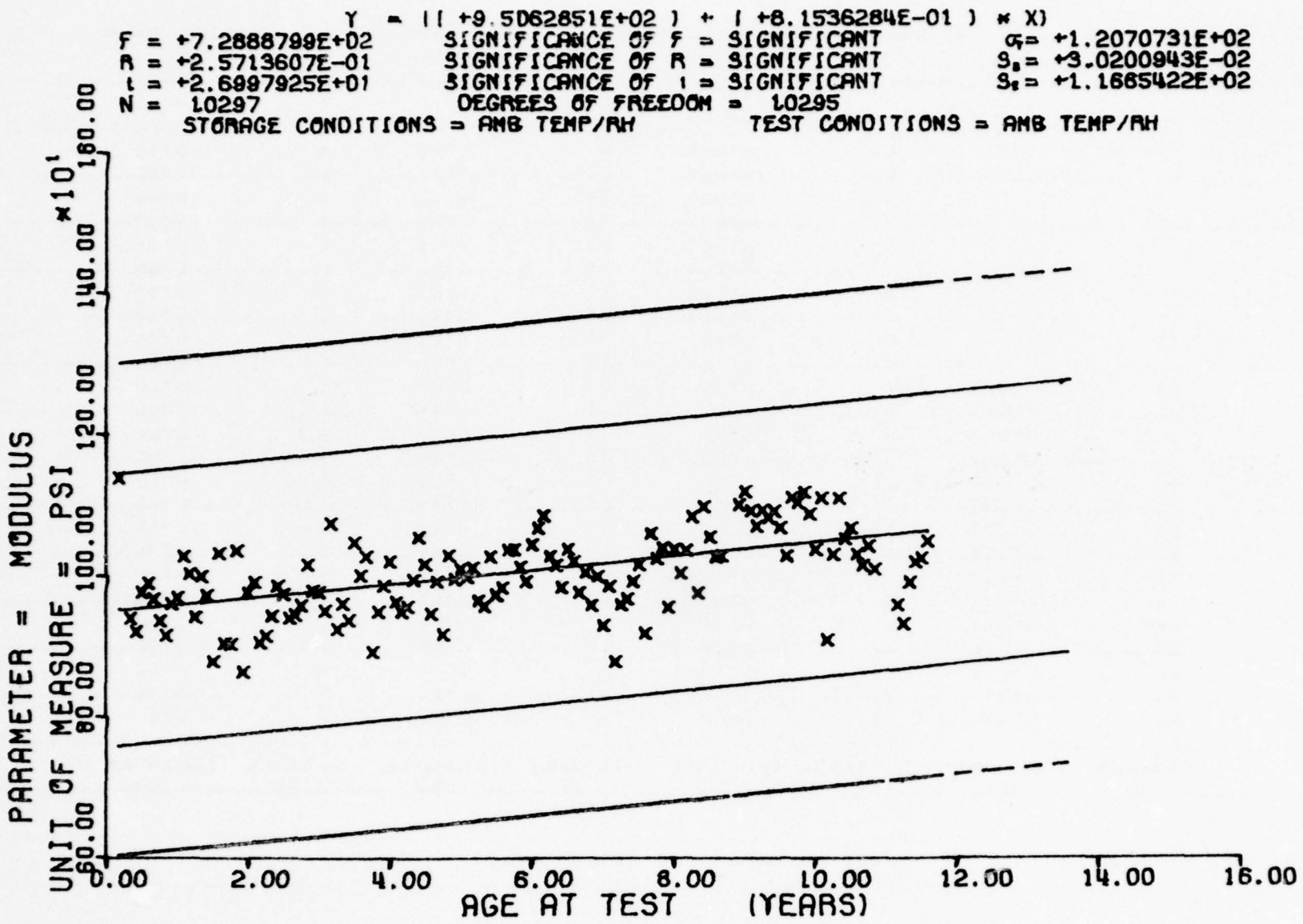

Y = (+9.5062851E+02) + (+8.1536284E-01) * X)
F = +7.2888799E+02
SIGNIFICANCE OF F = SIGNIFICANT
σ_Y = +1.2070731E+02
R = +2.5713607E-01
SIGNIFICANCE OF R = SIGNIFICANT
S_B = +3.0200943E-02
t = +2.6997925E+01
SIGNIFICANCE OF t = SIGNIFICANT
S_E = +1.1685422E+02
N = 10297
DEGREES OF FREEDOM = 10295
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
*10^1
160.00
140.00
120.00
100.00
80.00
60.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,MODULUS,CHS=2.0 IN/MIN TP-H1011

Figure 15

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
1.0	2	52.0	8	79.0	17	110.0	28
24.0	6	53.0	10	80.0	2	111.0	6
25.0	6	54.0	2	81.0	3	113.0	8
26.0	10	55.0	18	82.0	4	114.0	29
27.0	3	56.0	6	84.0	2	115.0	32
28.0	11	57.0	14	86.0	3	116.0	38
29.0	14	58.0	4	87.0	6	117.0	12
30.0	14	59.0	1	88.0	8	118.0	8
31.0	16	61.0	5	89.0	11	119.0	19
32.0	17	62.0	12	90.0	13	120.0	24
33.0	9	63.0	13	91.0	10	127.0	6
34.0	15	64.0	18	93.0	10	128.0	2
35.0	8	65.0	18	94.0	8	129.0	2
36.0	2	66.0	10	95.0	6	138.0	2
37.0	4	68.0	2	96.0	2	139.0	16
39.0	3	69.0	2	97.0	7		
40.0	3	70.0	10	98.0	2		
42.0	2	71.0	14	100.0	2		
44.0	2	72.0	12	101.0	4		
45.0	2	73.0	18	102.0	4		
46.0	2	74.0	18	103.0	4		
47.0	4	75.0	12	105.0	6		
49.0	4	76.0	16	106.0	4		
50.0	8	77.0	10	108.0	2		
51.0	4	78.0	6	109.0	13		

WING S.H.R.TRIAXIAL TENSILE, ,CHS=1750 IN/MIN AT 800 PSI

This sample size summary is applicable for figures 16 thru 20.

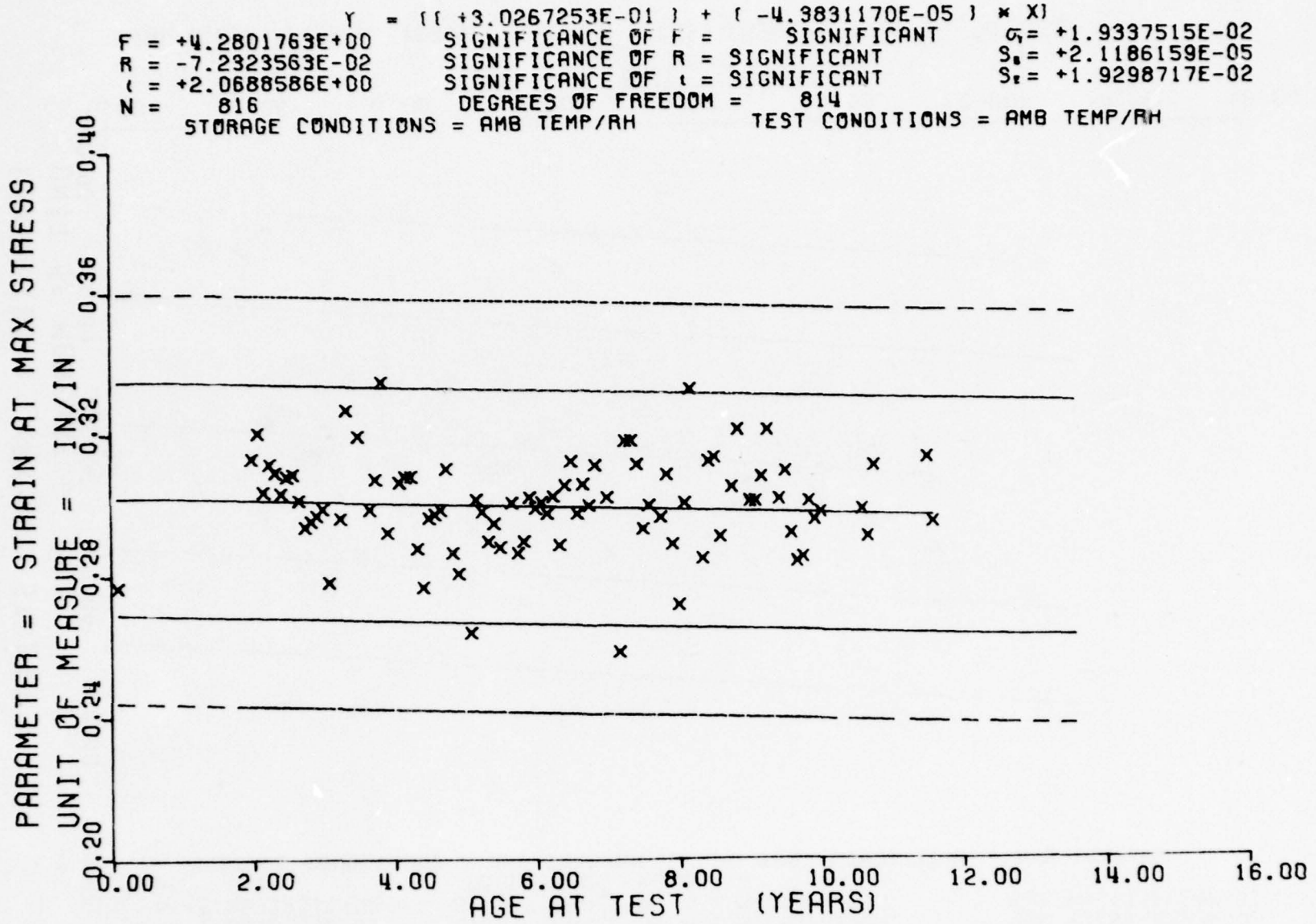

Y = [[+3.0267253E-01] + [-4.3831170E-05] * X]
F = +4.2801763E+00 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.9337515E-02
R = -7.2323563E-02 SIGNIFICANCE OF R = SIGNIFICANT Sa = +2.1186159E-05
t = +2.0688586E+00 SIGNIFICANCE OF t = SIGNIFICANT St = +1.9298717E-02
N = 816 DEGREES OF FREEDOM = 814
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.40
0.36
0.32
0.28
0.24
0.20
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.TRIAXIAL TENSILE,STRAIN AT MAX STRESS,CHS=1750 IN/MIN,800 PSI

Figure 16

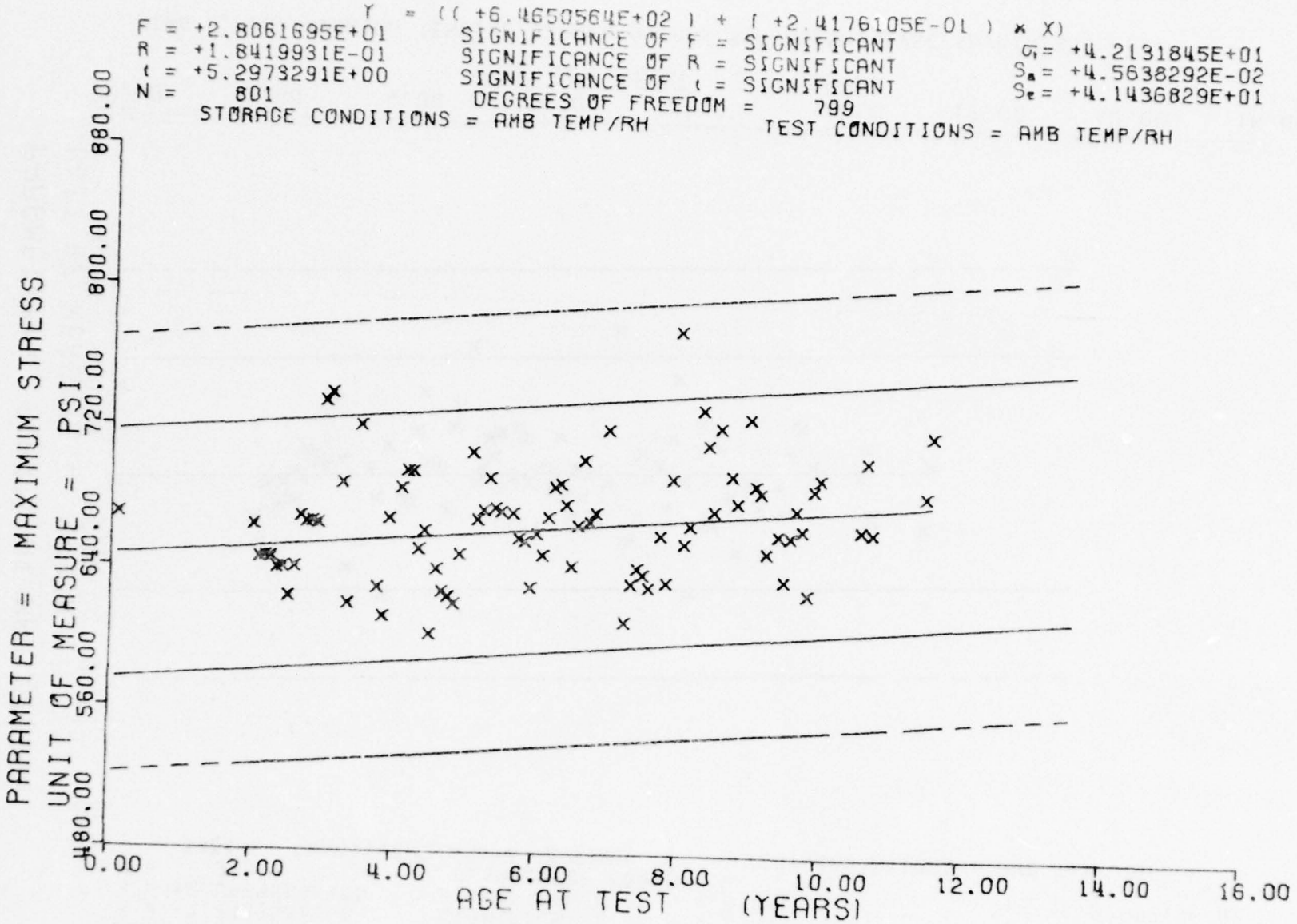

Y = ((+6.4650564E+02) + (+2.4176105E-01) * X)
F = +2.8061695E+01
SIGNIFICANCE OF F = SIGNIFICANT
R = +1.8419931E-01
SIGNIFICANCE OF R = SIGNIFICANT
t = +5.2973291E+00
SIGNIFICANCE OF t = SIGNIFICANT
N = 801
DEGREES OF FREEDOM = 799
σ = +4.2131845E+01
Sa = +4.5638292E-02
Se = +4.1436829E+01
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
880.00
800.00
720.00
640.00
560.00
480.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.TRIAXIAL TENSILE,MAXIMUM STRESS,CHS=1750 IN/MIN, 800 PSI

Figure 17

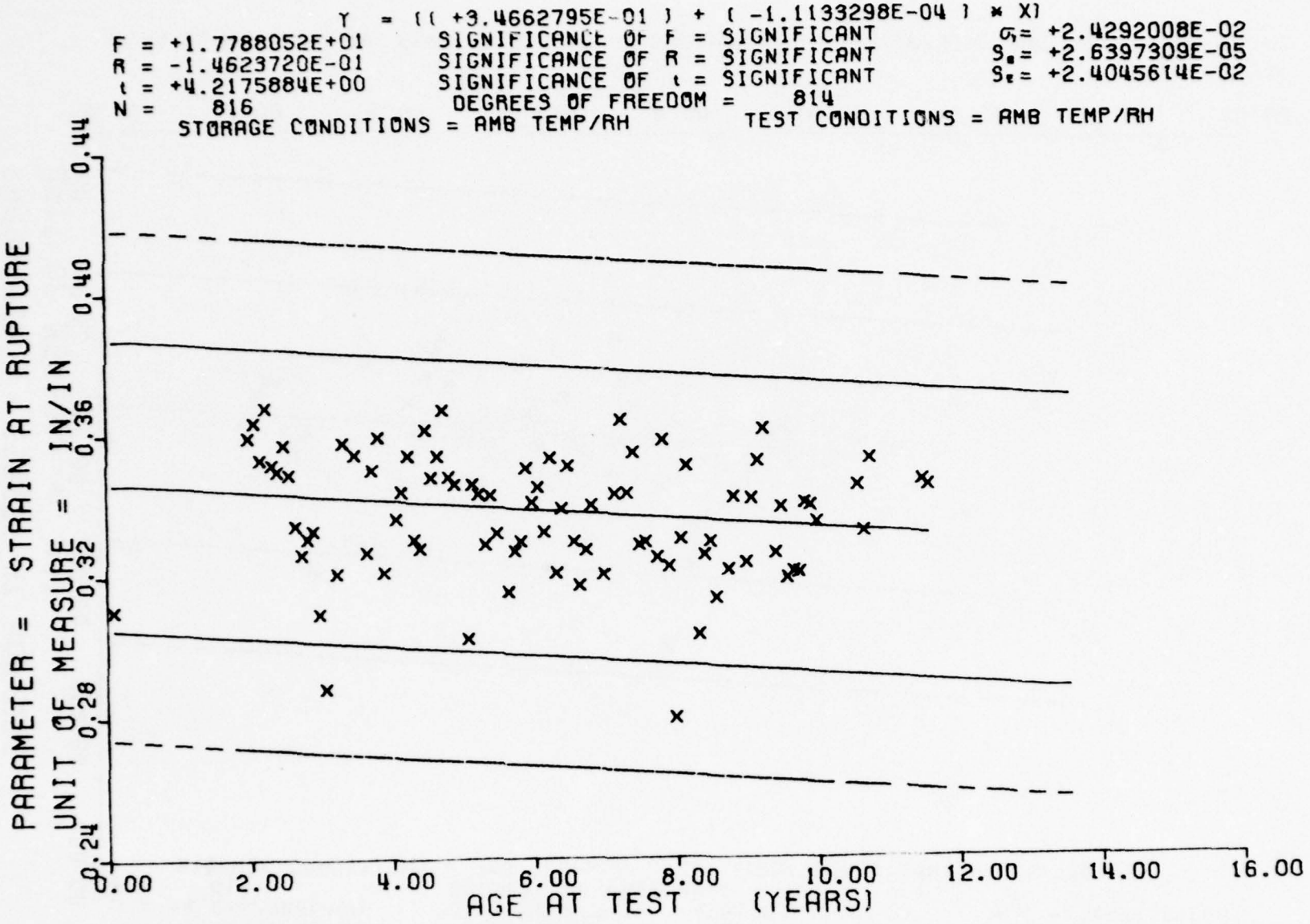

Y = ((+3.4662795E-01) + (-1.1133298E-04) * X)
F = +1.7788052E+01
SIGNIFICANCE OF F = SIGNIFICANT
σ1= +2.4292008E-02
R = -1.4623720E-01
SIGNIFICANCE OF R = SIGNIFICANT
Se= +2.6397309E-05
t = +4.2175884E+00
SIGNIFICANCE OF t = SIGNIFICANT
Sε= +2.4045614E-02
N = 816
DEGREES OF FREEDOM = 814
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.44
0.40
0.36
0.32
0.28
0.24
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.TRIAXIAL TENSILE,STRAIN AT RUPTURE,CHS=1750 IN/MIN, 800 PSI

Figure 18

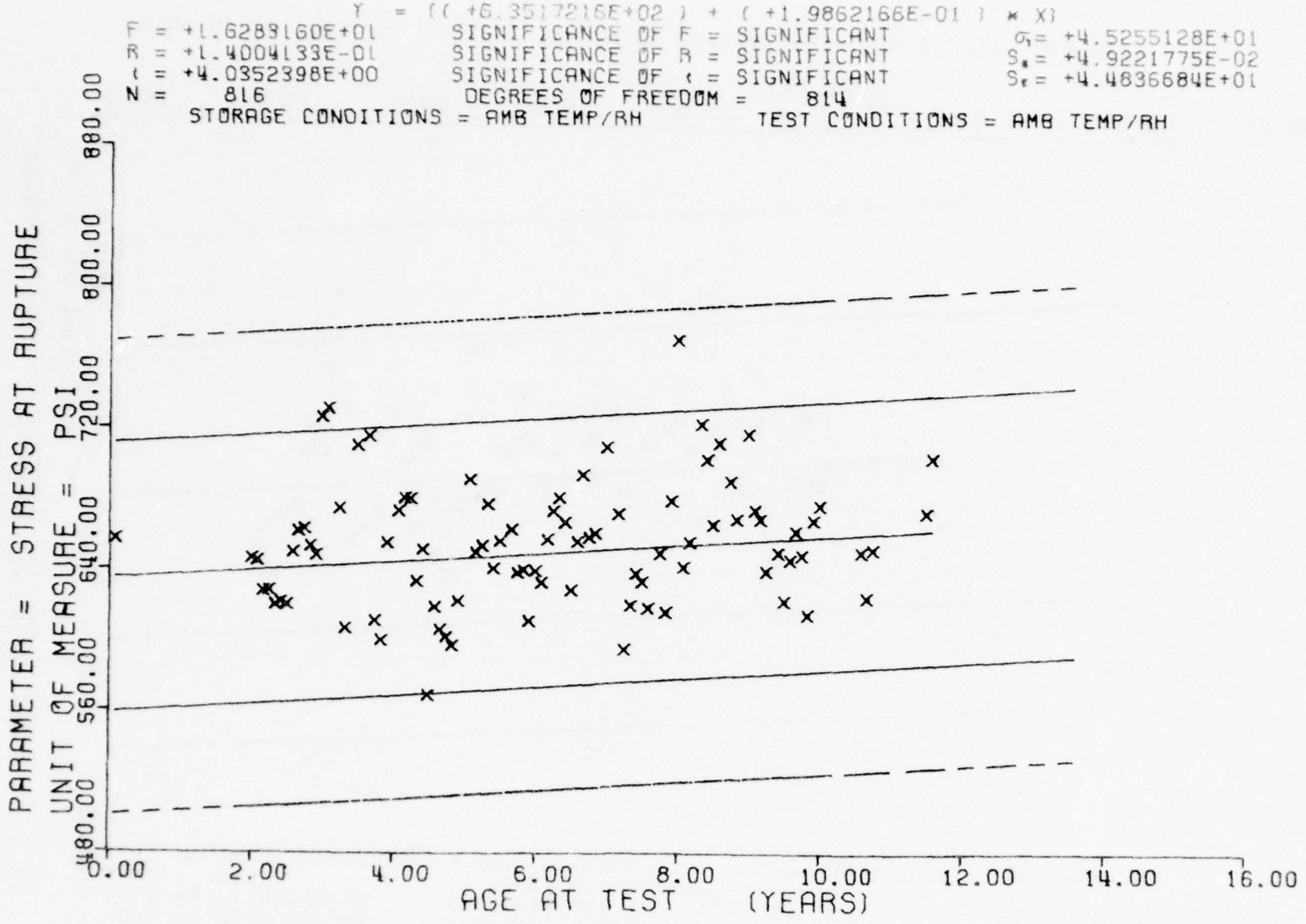

Y = ((+6.3517216E+02) + (+1.9862166E-01) * X)
F = +1.6289160E+01
R = +1.4004133E-01
ε = +4.0352398E+00
N = 816
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF ε = SIGNIFICANT
DEGREES OF FREEDOM = 814
σt = +4.5255128E+01
Sa = +4.9221775E-02
Se = +4.4836684E+01
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI
480.00
560.00
640.00
720.00
800.00
880.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.TRIAXIAL TENSILE,STRESS AT RUPTURE,CHS=1750 IN/MIN, 800 PSI

Figure 19

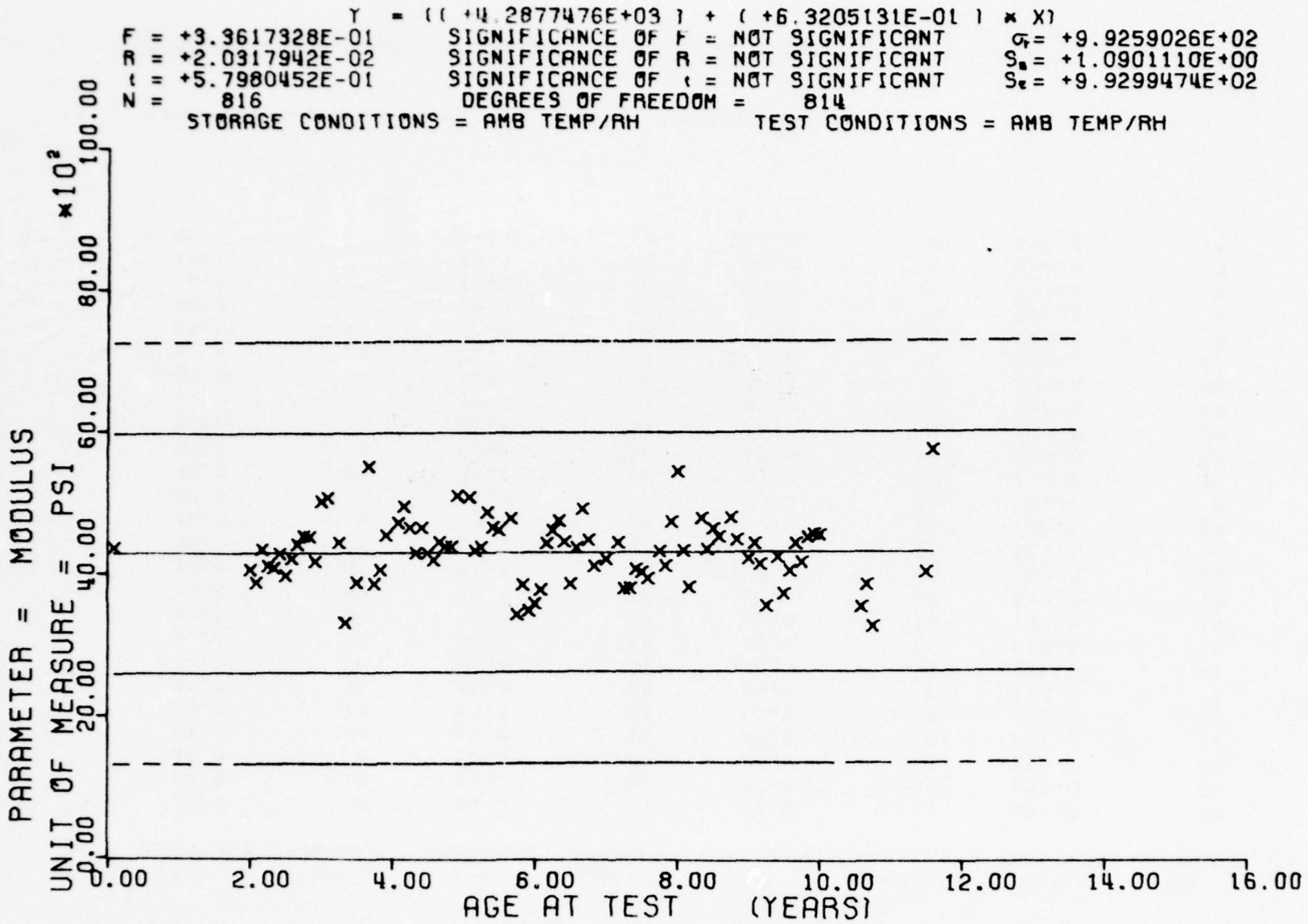

Y = ((+4.2877476E+03) + (+6.3205131E-01) * X)
F = +3.3617328E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +9.9259026E+02
R = +2.0317942E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S = +1.0901110E+00
t = +5.7980452E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S = +9.9299474E+02
N = 816 DEGREES OF FREEDOM = 814
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI x10²
100.00
80.00
60.00
40.00
20.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.A.TRIAXIAL TENSILE,MODULUS,CHS=1750 IN/MIN AT 800 PSI

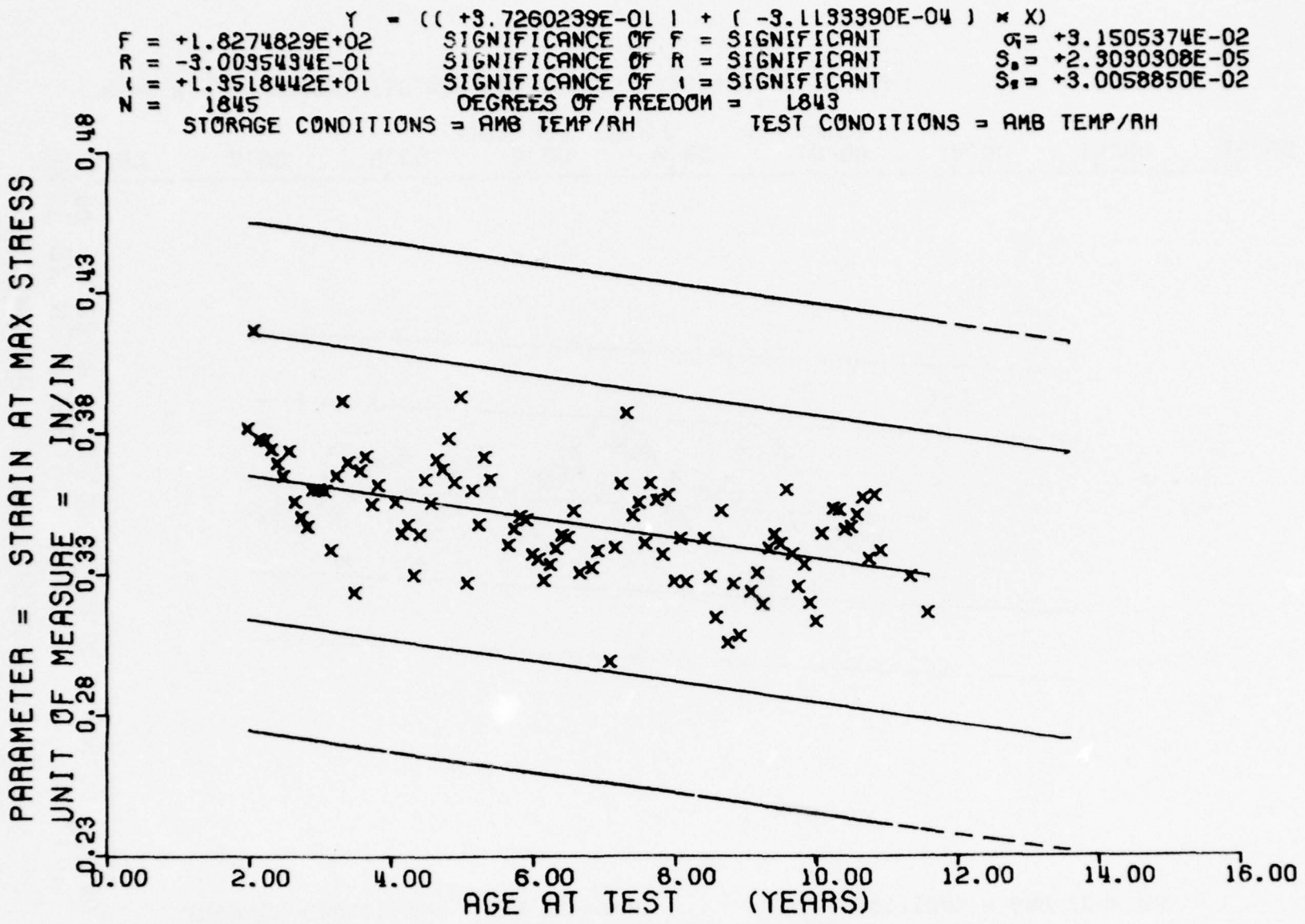
Figure 20

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
24.0	9	51.0	11	78.0	21	107.0	10
25.0	12	52.0	42	79.0	55	109.0	21
26.0	6	53.0	22	80.0	5	110.0	32
27.0	21	54.0	10	82.0	6	111.0	12
28.0	12	55.0	31	83.0	10	112.0	6
29.0	29	56.0	26	85.0	5	113.0	75
30.0	18	57.0	39	86.0	5	114.0	41
31.0	21	58.0	25	87.0	21	115.0	15
32.0	31	59.0	4	88.0	15	116.0	15
33.0	23	60.0	5	89.0	40	117.0	75
34.0	21	61.0	16	90.0	40	118.0	12
35.0	5	62.0	40	91.0	15	119.0	34
36.0	8	63.0	84	92.0	14	120.0	29
37.0	9	64.0	17	93.0	20	121.0	3
38.0	10	65.0	25	94.0	20	123.0	15
39.0	5	68.0	16	95.0	10	124.0	12
40.0	3	69.0	27	96.0	5	125.0	30
41.0	5	70.0	27	97.0	20	126.0	12
42.0	1	71.0	24	98.0	5	127.0	24
43.0	5	72.0	11	101.0	15	128.0	21
44.0	10	73.0	44	102.0	5	129.0	6
45.0	5	74.0	38	103.0	5	130.0	9
46.0	5	75.0	28	104.0	14	131.0	6
49.0	8	76.0	19	105.0	5	136.0	3
50.0	5	77.0	15	106.0	5	139.0	12

WING 6.H.R.HYDROSTATIC, .1750 IN/MIN, 800 PSI

This sample size summary is applicable for figures 21 thru 25.



WING 6, H.R. HYDROSTATIC, STRAIN AT MAX STRESS, 1750IN/MIN, 800 PSI

Figure 21

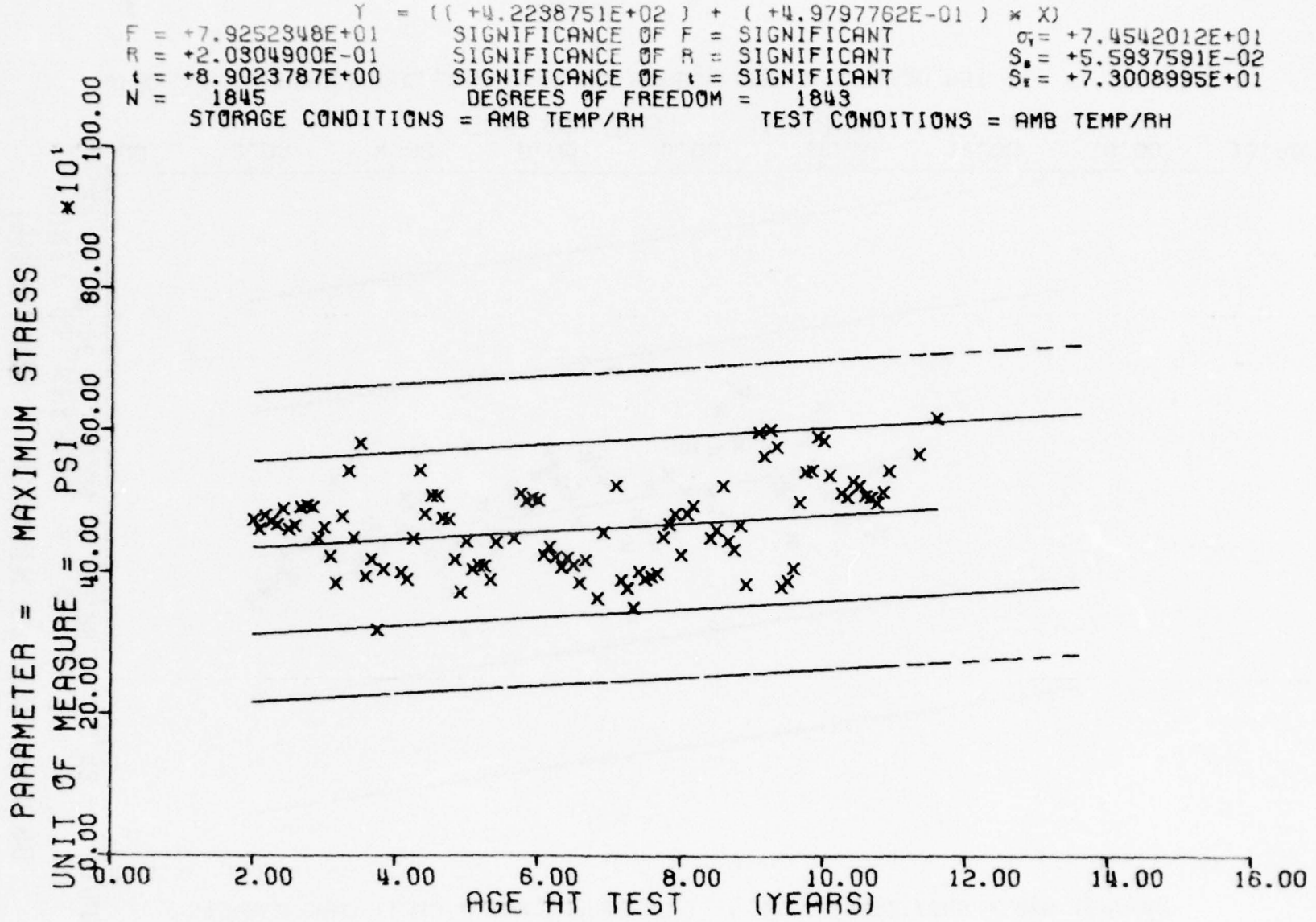

Y = ((+4.2238751E+02) + (+4.9797762E-01) * X)
F = +7.9252348E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +7.4542012E+01
R = +2.0304900E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +5.5937591E-02
t = +8.9023787E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +7.3008995E+01
N = 1845 DEGREES OF FREEDOM = 1843
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI *10¹
0.00
20.00
40.00
60.00
80.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.HYDROSTATIC,MAXIMUM STRESS,1750IN/MIN,800 PSI

Figure 22

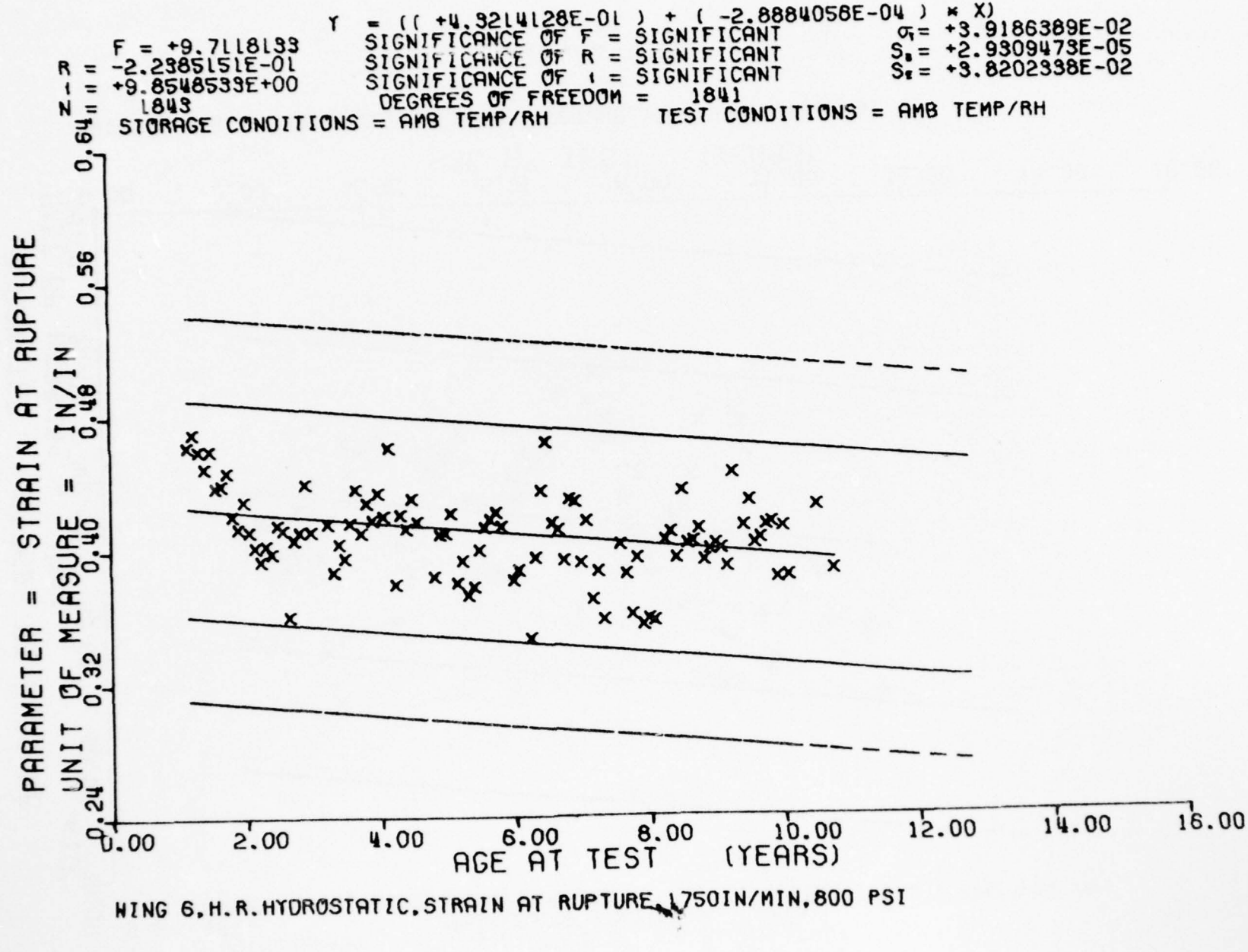

Y = ((+4.3214128E-01) + (-2.8884058E-04) * X)
F = +9.7118133
SIGNIFICANCE OF F = SIGNIFICANT
σ = +3.9186389E-02
R = -2.3851515E-01
SIGNIFICANCE OF R = SIGNIFICANT
S = +2.9309473E-05
t = +9.8548539E+00
SIGNIFICANCE OF t = SIGNIFICANT
S = +3.8202338E-02
N = 1843
DEGREES OF FREEDOM = 1841
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.64
0.56
0.48
0.40
0.32
0.24
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6.H.R.HYDROSTATIC.STRAIN AT RUPTURE.1750IN/MIN.800 PSI

Figure 23

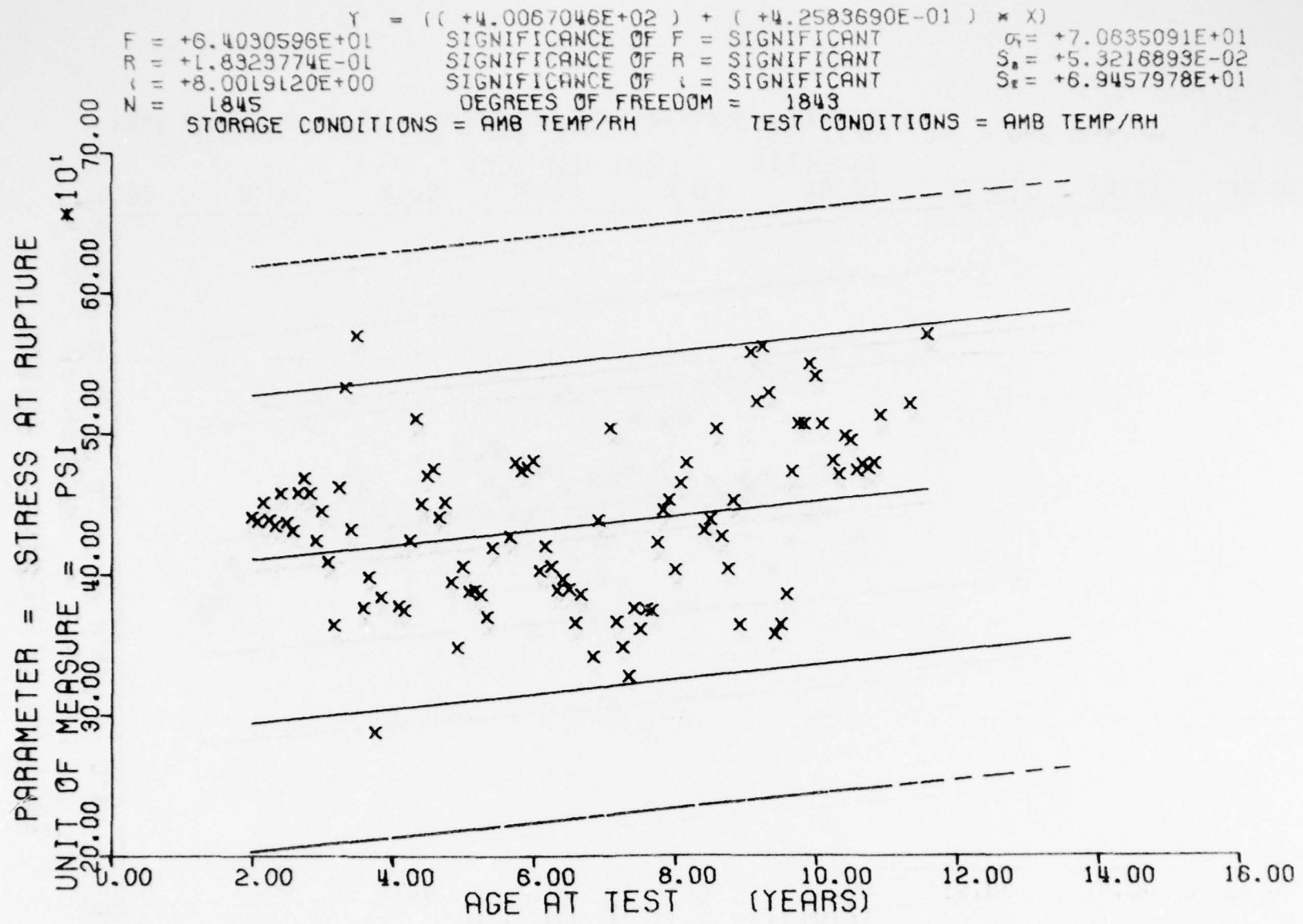

Y = ((+4.0067046E+02) + (+4.2583690E-01) * X)
F = +6.4030596E+01 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +7.0835091E+01
R = +1.8323774E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +5.3216893E-02
t = +8.0019120E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +6.9457978E+01
N = 1845 DEGREES OF FREEDOM = 1843
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI *10¹
70.00
60.00
50.00
40.00
30.00
20.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.HYDROSTATIC,STRESS AT RUPTURE,1750IN/MIN,800 PSI

Figure 24

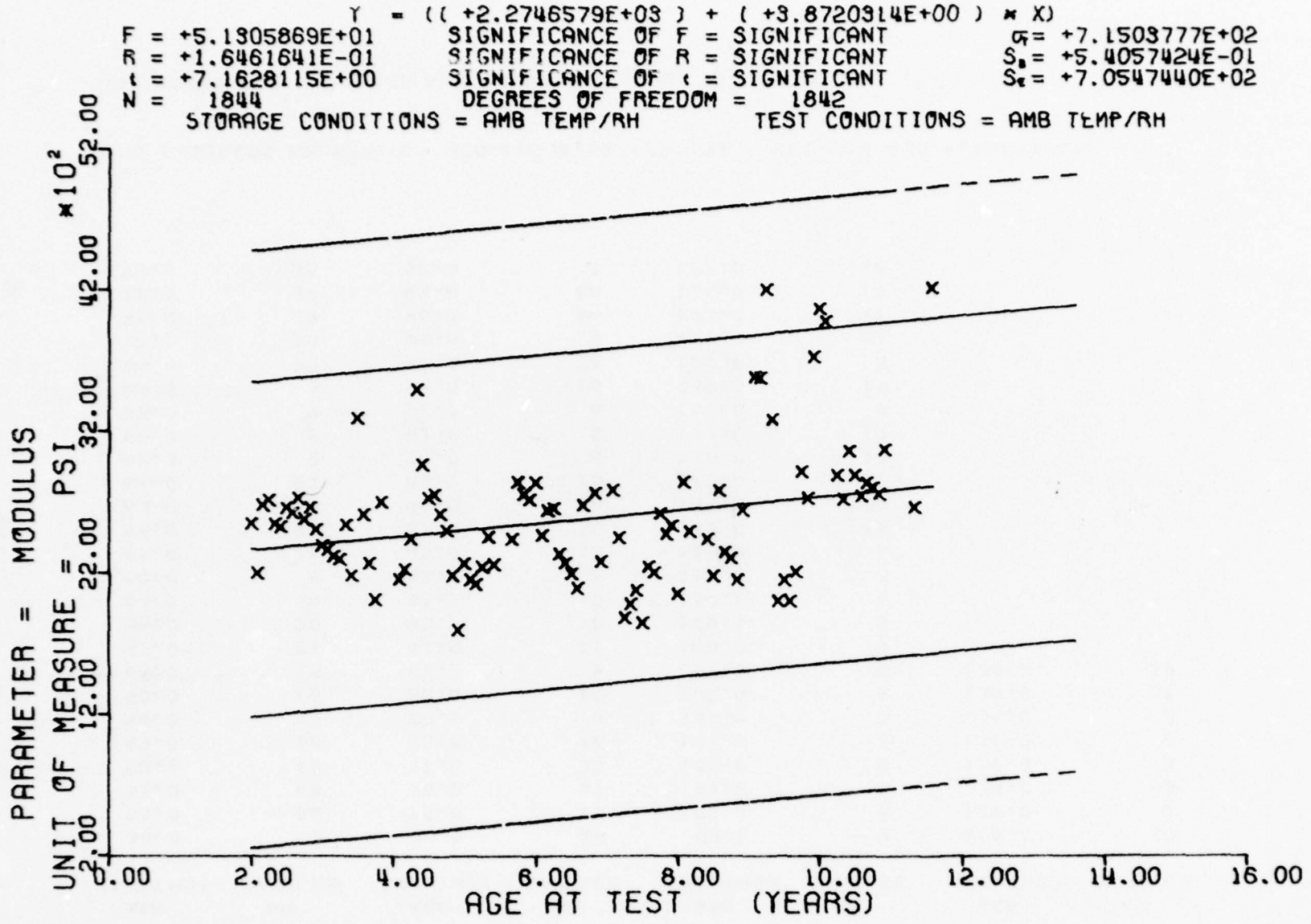

Y = ((+2.2746579E+03) + (+3.8720314E+00) * X)
F = +5.1305869E+01 SIGNIFICANCE OF F = SIGNIFICANT σT = +7.1503777E+02
R = +1.6461641E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +5.4057424E-01
t = +7.1628115E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +7.0547440E+02
N = 1844 DEGREES OF FREEDOM = 1842
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10²
52.00
42.00
32.00
22.00
12.00
2.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.HYDROSTATIC,MODULUS,1750 IN/MIN, 800 PSI

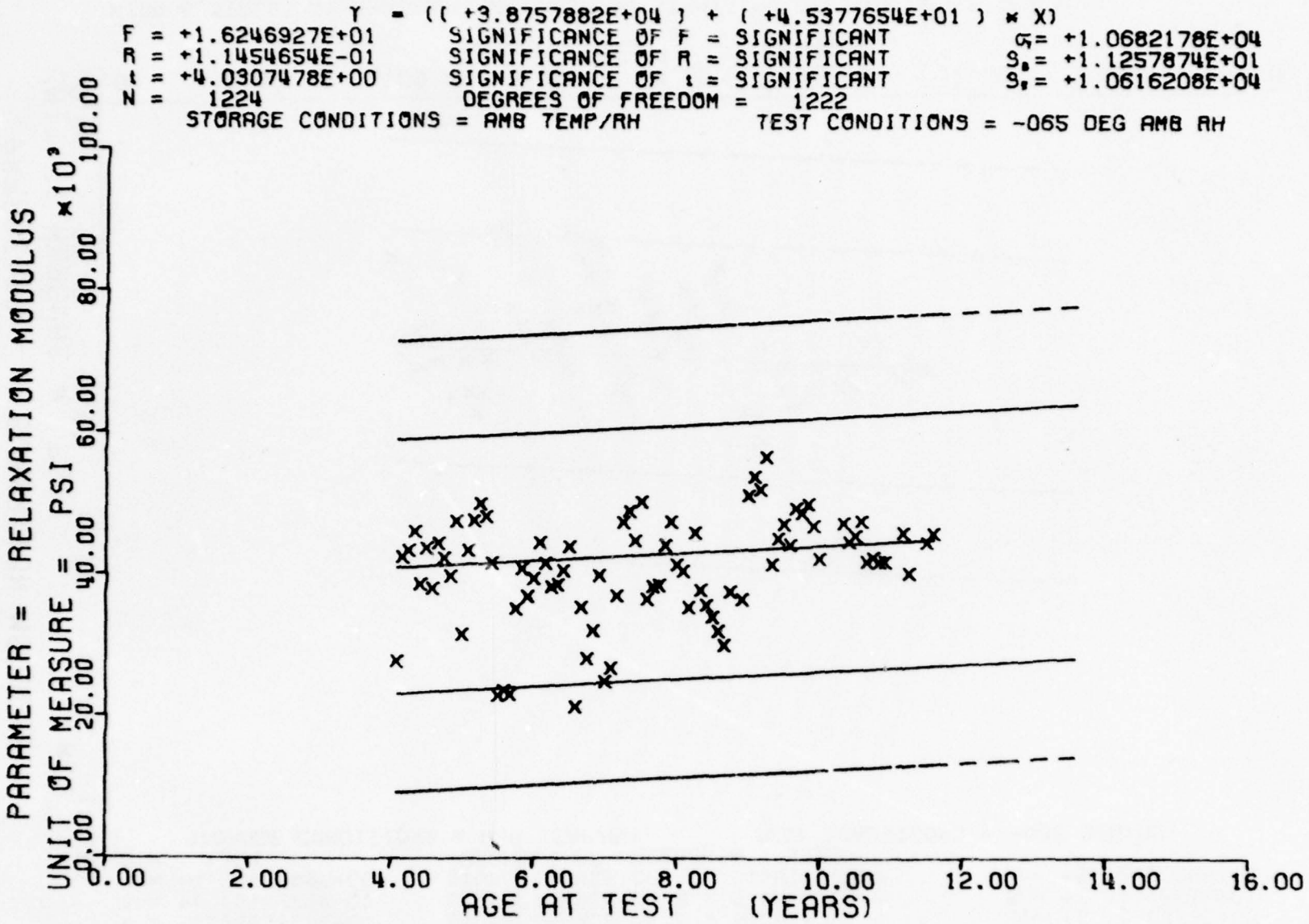
Figure 25

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
49.0	2	74.0	29	99.0	3	128.0	15
50.0	26	75.0	23	100.0	6	129.0	2
51.0	49	76.0	17	101.0	6	130.0	3
52.0	43	77.0	34	102.0	5	131.0	3
53.0	18	78.0	16	103.0	6	134.0	6
54.0	27	79.0	3	104.0	3	135.0	3
55.0	18	80.0	14	105.0	6	138.0	27
56.0	15	81.0	5	107.0	6	139.0	39
57.0	21	82.0	11	108.0	9		
58.0	20	83.0	6	109.0	6		
59.0	9	84.0	5	110.0	6		
60.0	9	85.0	6	111.0	3		
61.0	21	86.0	3	112.0	8		
62.0	46	87.0	18	113.0	45		
63.0	23	88.0	16	114.0	15		
64.0	27	89.0	15	115.0	12		
65.0	9	90.0	6	116.0	17		
66.0	2	91.0	5	117.0	12		
67.0	9	92.0	6	118.0	9		
68.0	3	93.0	16	119.0	17		
69.0	20	94.0	14	120.0	3		
70.0	30	95.0	9	124.0	21		
71.0	38	96.0	14	125.0	17		
72.0	30	97.0	12	126.0	18		
73.0	30	98.0	7	127.0	12		

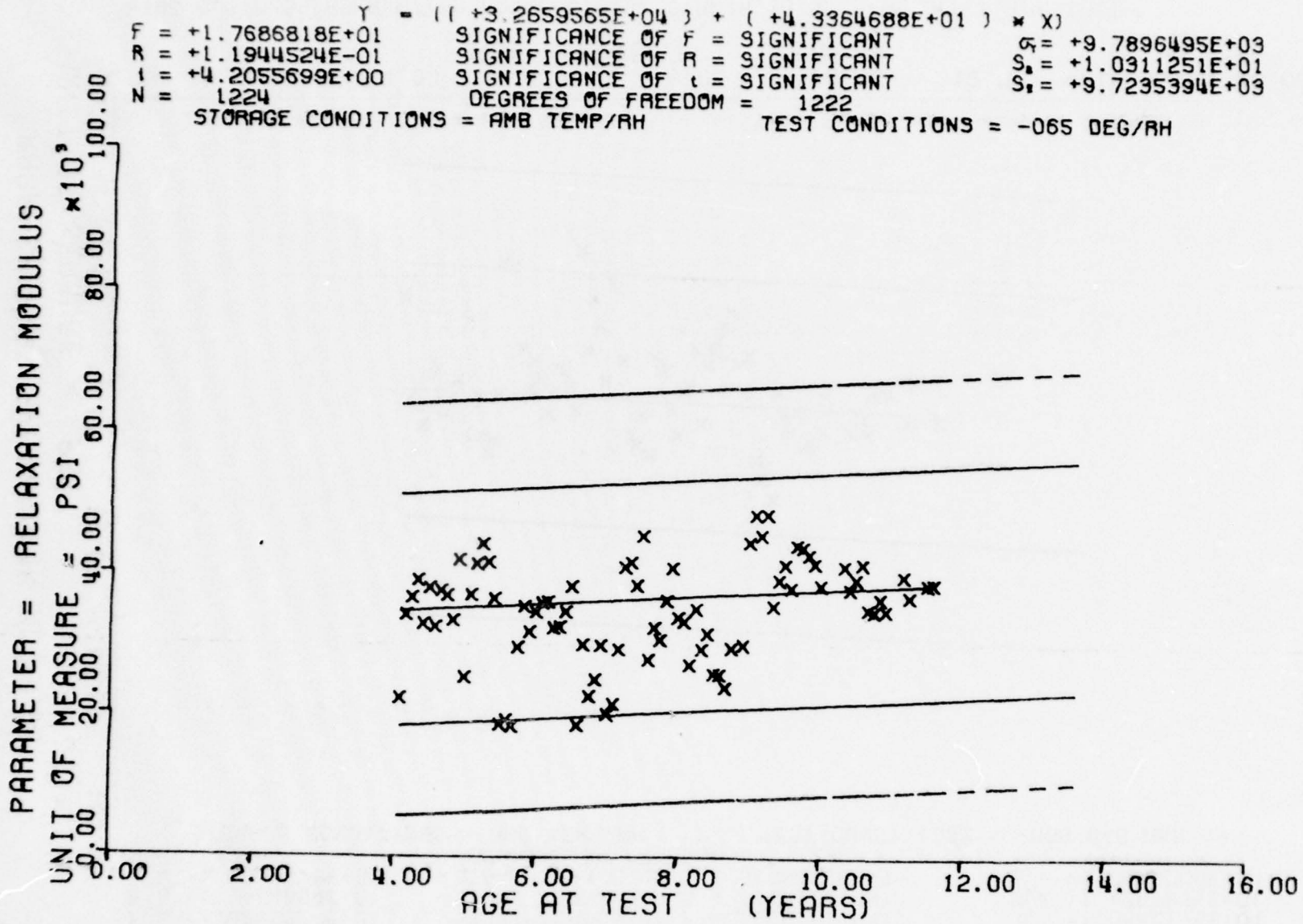
WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN, SEC,-65 DEC F,TPH-1011

This sample size summary is applicable for figures 26 thru 29.



WING 6, STRESS RELAXATION MODULUS, 0.5% STRAIN, 10 SEC, -65 DEG F, TPH-1011

Figure 26



WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,50 SEC,-65 DEG F,TPH-1011

Figure 27

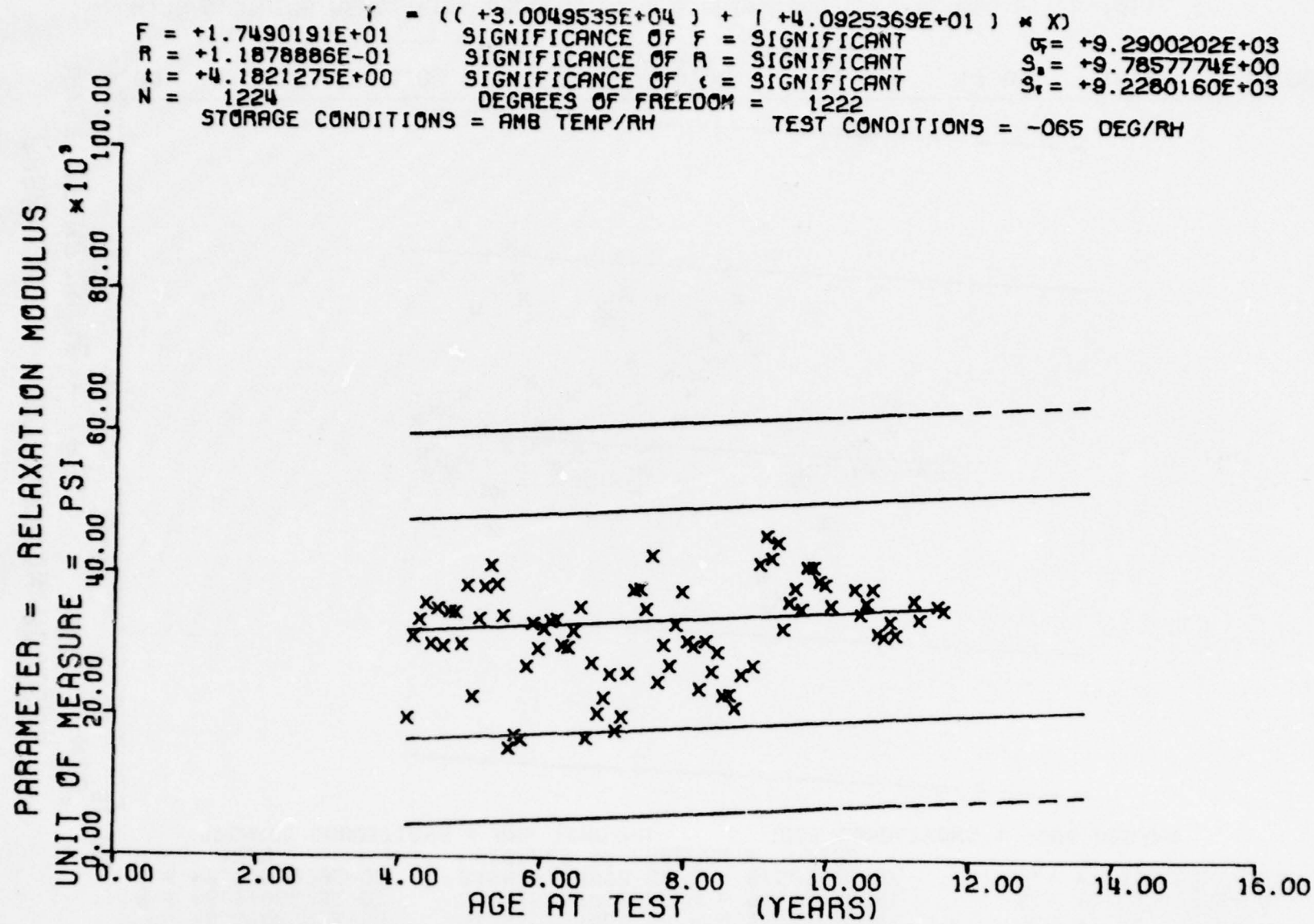
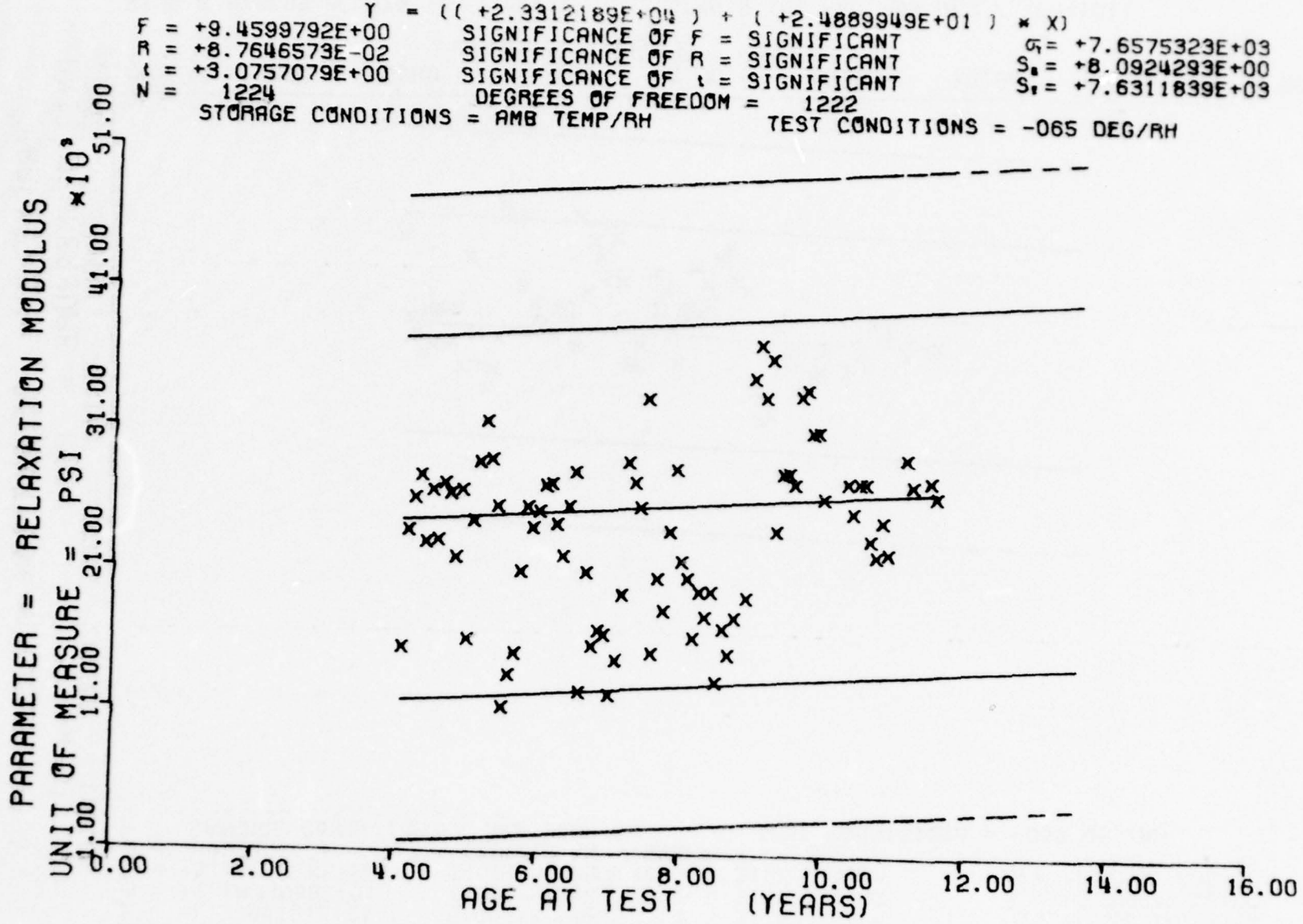

Y = ((+3.0049535E+04) + (+4.0925369E+01) * X)
F = +1.7490191E+01
SIGNIFICANCE OF F = SIGNIFICANT
σ = +9.2900202E+03
R = +1.1878886E-01
SIGNIFICANCE OF R = SIGNIFICANT
S = +9.7857774E+00
t = +4.1821275E+00
SIGNIFICANCE OF t = SIGNIFICANT
S = +9.2280160E+03
N = 1224
DEGREES OF FREEDOM = 1222
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = -065 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10³
0.00
20.00
40.00
60.00
80.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,100 SEC,-65 DEG F,TPH-1011

Figure 28



WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,1000 SEC,-65 DEG F,TPH-1011

Figure 29

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
49.0	6	74.0	25	99.0	6	127.0	44
50.0	27	75.0	19	100.0	3	128.0	11
51.0	51	76.0	26	101.0	6	129.0	1
52.0	44	77.0	30	102.0	6	131.0	1
53.0	14	78.0	17	103.0	6	134.0	27
54.0	30	79.0	3	104.0	3	135.0	3
55.0	18	80.0	16	105.0	6	138.0	24
56.0	12	81.0	6	107.0	6	139.0	42
57.0	24	82.0	12	108.0	9		
58.0	18	83.0	6	109.0	6		
59.0	9	84.0	9	110.0	6		
60.0	12	85.0	3	111.0	3		
61.0	20	86.0	6	112.0	9		
62.0	48	87.0	15	113.0	47		
63.0	24	88.0	20	114.0	13		
64.0	21	89.0	12	115.0	9		
65.0	9	90.0	5	116.0	18		
66.0	6	91.0	9	117.0	12		
67.0	6	92.0	12	118.0	9		
68.0	6	93.0	12	119.0	15		
69.0	21	94.0	13	120.0	3		
70.0	30	95.0	6	123.0	2		
71.0	41	96.0	18	124.0	10		
72.0	36	97.0	14	125.0	13		
73.0	23	98.0	9	126.0	16		

WING 6.STRESS RELAXATION MODULUS.0.5% STRAIN. , SEC.-40 DEG F.TPH-1011

This sample size summary is applicable for figures 30 thru 33

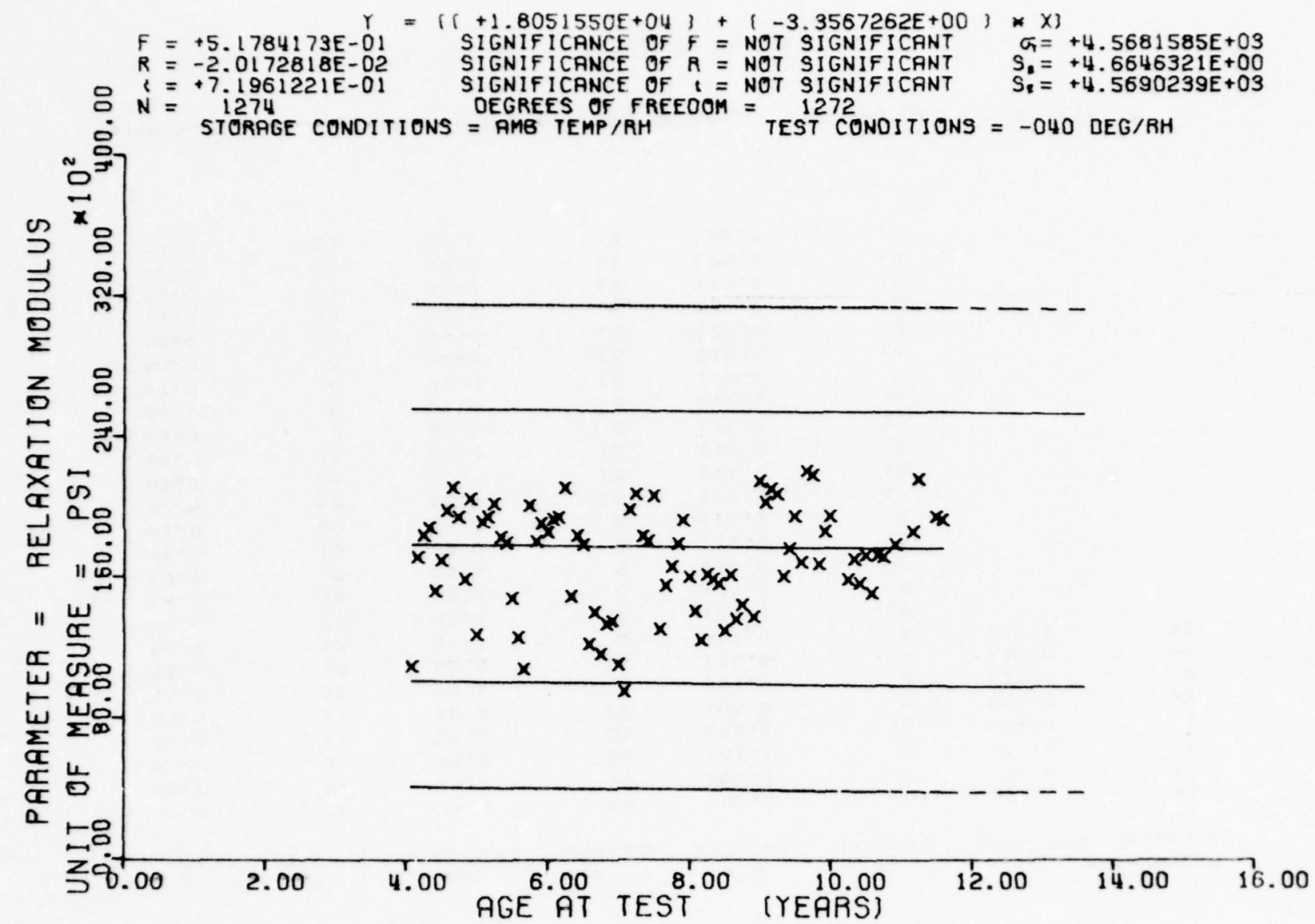

Y = { +1.8051550E+04 } + { -3.3567262E+00 } * X}
F = +5.1784173E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +4.5681585E+03
R = -2.0172818E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S = +4.6646321E+00
t = +7.1961221E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S = +4.5690239E+03
N = 1274 DEGREES OF FREEDOM = 1272
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -040 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10²
0.00
80.00
160.00
240.00
320.00
400.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,10 SEC,-40 DEG F,TPH-1011

Figure 30

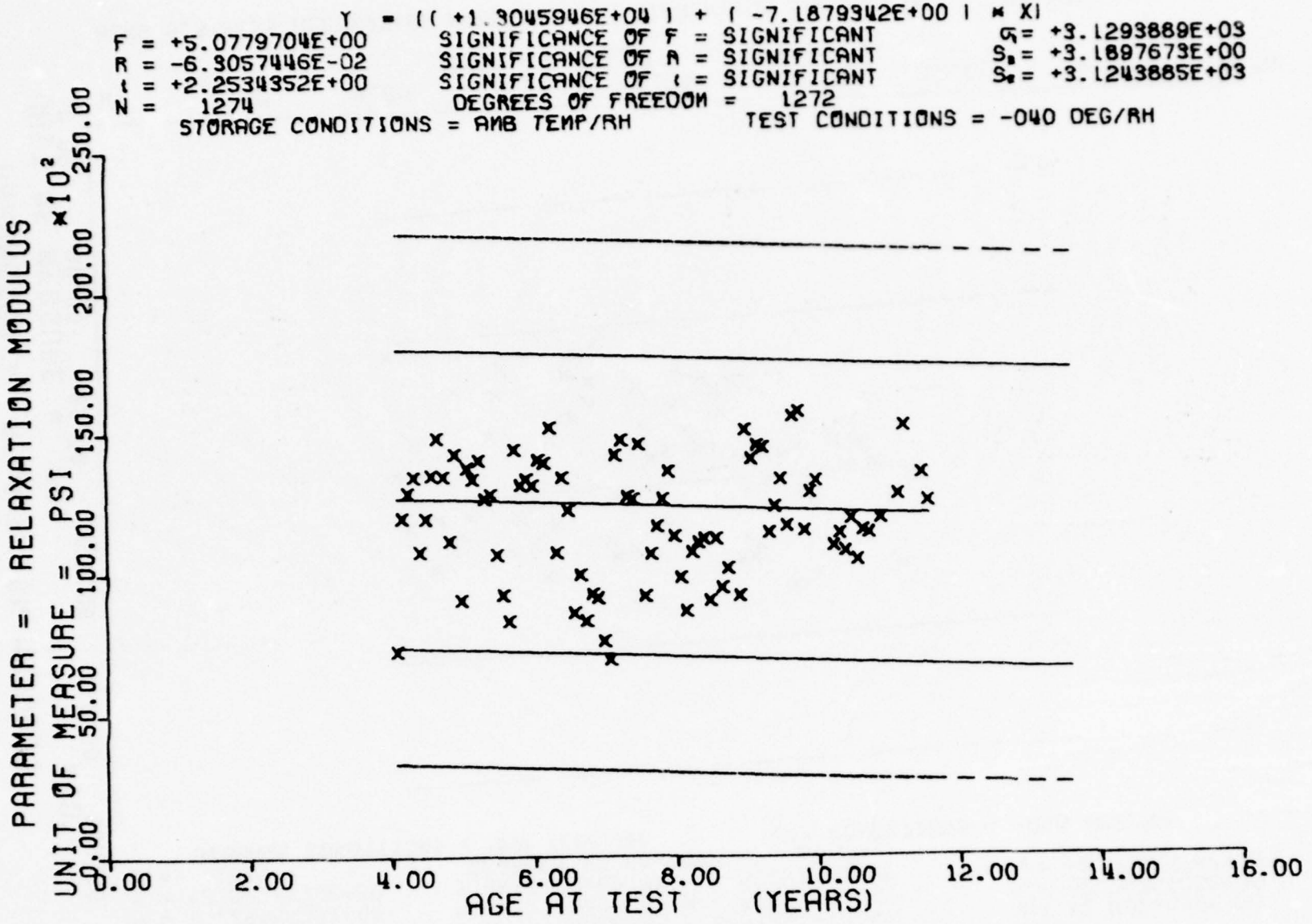
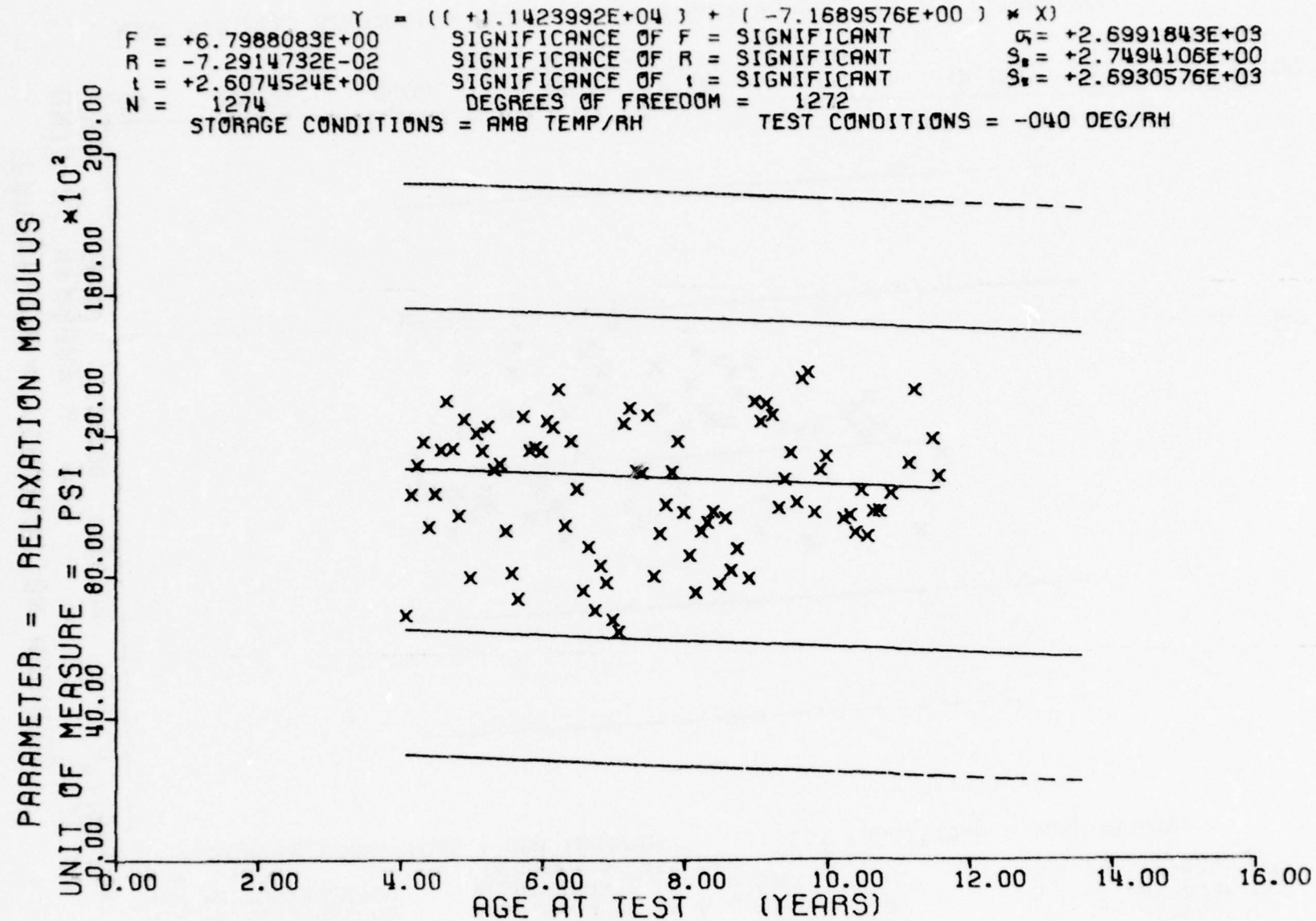
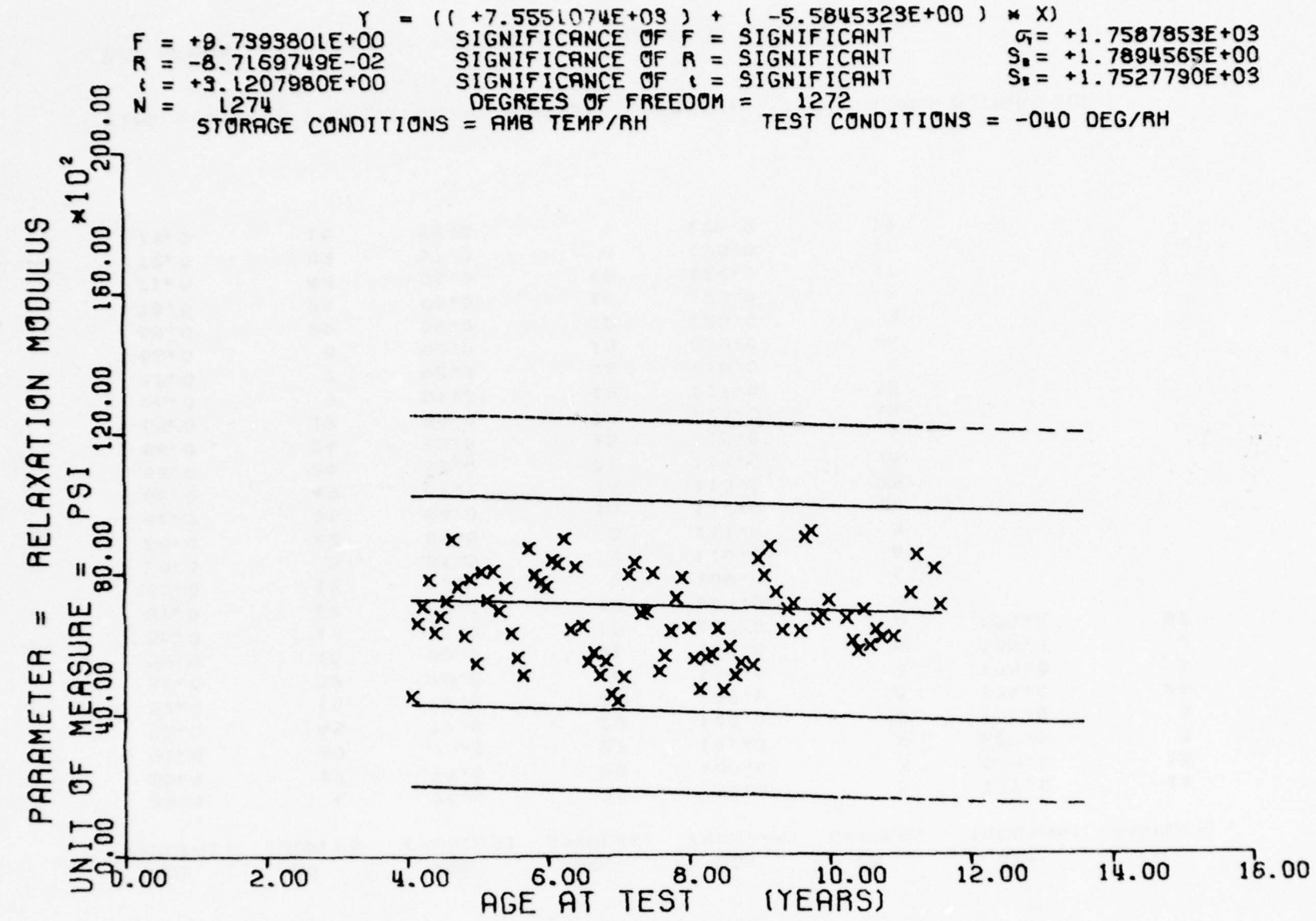

Y = ((+1.3045946E+04) + (-7.1879342E+00) * X)
F = +5.0779704E+00
R = -6.3057446E-02
t = +2.2534352E+00
N = 1274
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 1272
σ = +3.1293889E+03
S_b = +3.1897673E+00
S_e = +3.1243885E+03
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = -040 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10²
0.00
50.00
100.00
150.00
200.00
250.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,50 SEC,-40 DEG F,TPH-1011

Figure 31



WING 6, STRESS RELAXATION MODULUS, 0.5% STRAIN, 100 SEC, -40 DEG F, TPH-1011

Figure 32



WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,1000 SEC,-40 DEG F,TPH-1011

Figure 33

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
49.0	6	74.0	33	99.0	6	127.0	11
50.0	27	75.0	29	100.0	3	128.0	15
51.0	59	76.0	23	101.0	9	129.0	3
52.0	45	77.0	28	102.0	5	131.0	3
53.0	15	78.0	21	103.0	6	134.0	24
54.0	32	79.0	6	104.0	3	135.0	3
55.0	18	80.0	21	105.0	6	138.0	9
56.0	18	81.0	12	107.0	6	139.0	57
57.0	27	82.0	12	108.0	9		
58.0	15	83.0	9	109.0	6		
59.0	6	84.0	9	110.0	6		
60.0	22	85.0	3	111.0	3		
61.0	21	86.0	15	112.0	24		
62.0	49	87.0	14	113.0	38		
63.0	24	88.0	21	114.0	14		
64.0	24	89.0	15	115.0	9		
65.0	12	90.0	15	116.0	15		
66.0	9	91.0	12	117.0	12		
67.0	7	92.0	12	118.0	9		
68.0	6	93.0	15	119.0	24		
69.0	29	94.0	12	120.0	3		
70.0	24	95.0	14	123.0	6		
71.0	43	96.0	18	124.0	17		
72.0	39	97.0	6	125.0	15		
73.0	18	98.0	9	126.0	17		

WING 6.STRESS RELAXATION MODULUS.3.0% STRAIN. SEC. 20 DEG F.TPH-1011

This sample size summary is applicable for figures 34 thru 37.

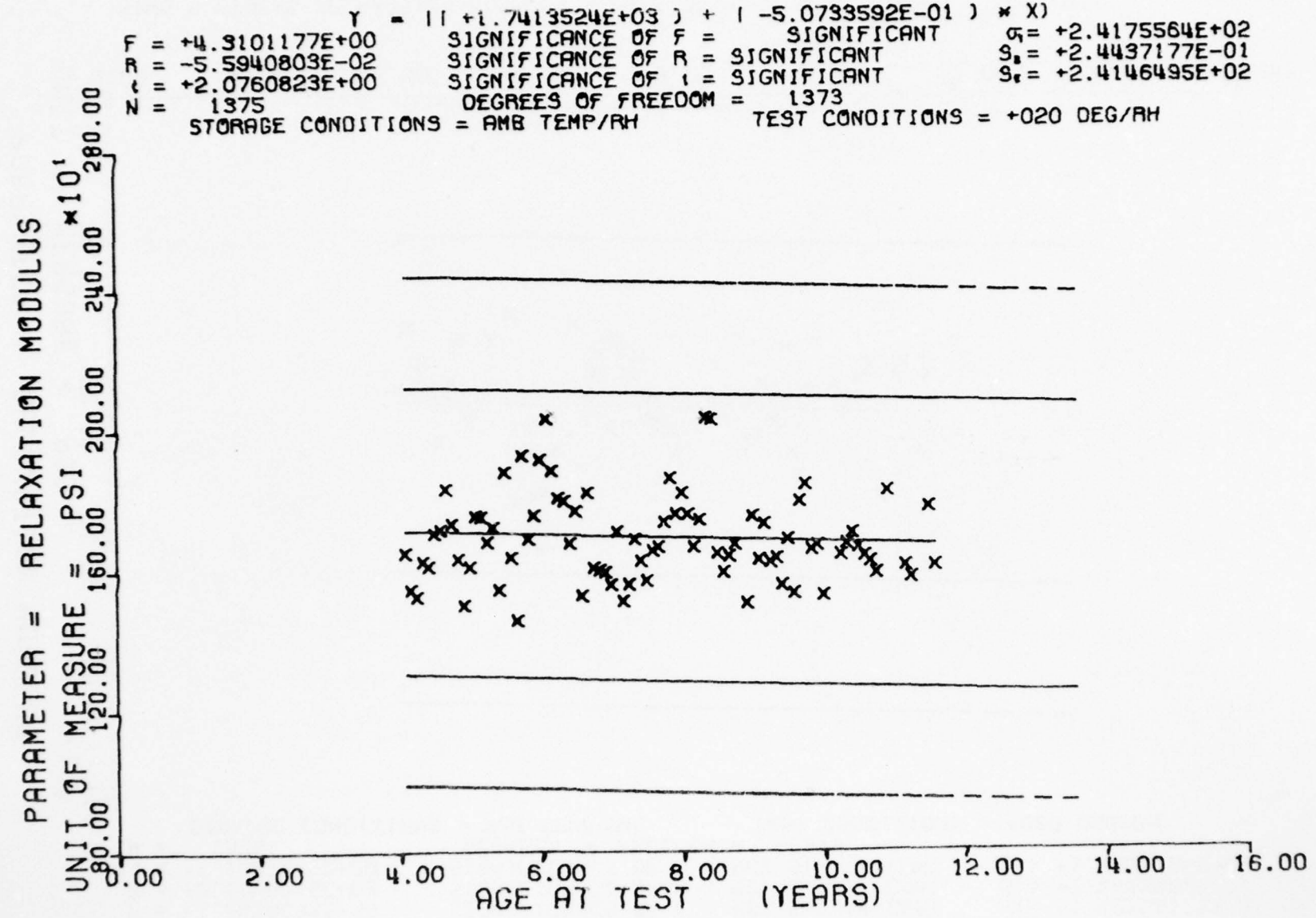
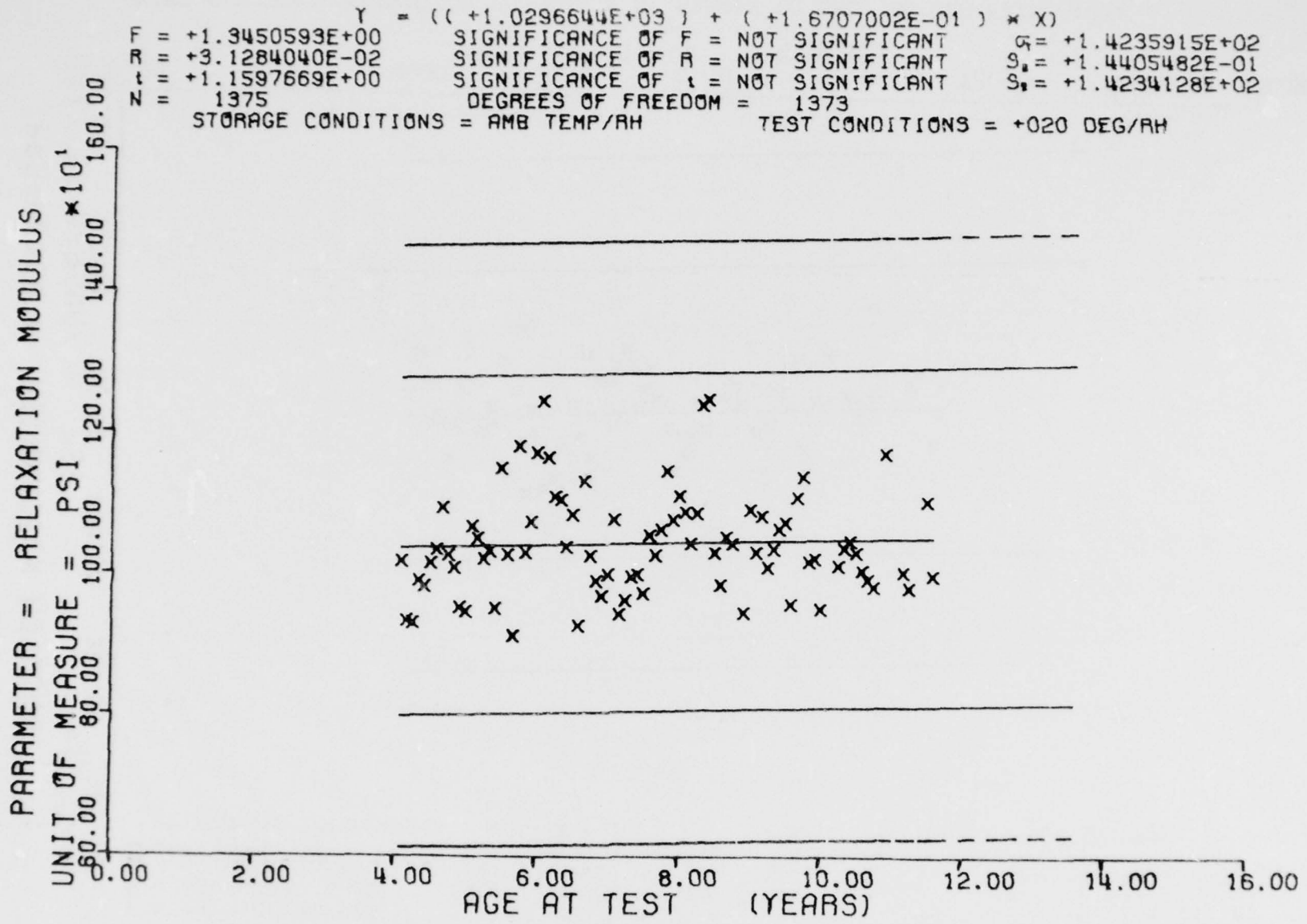
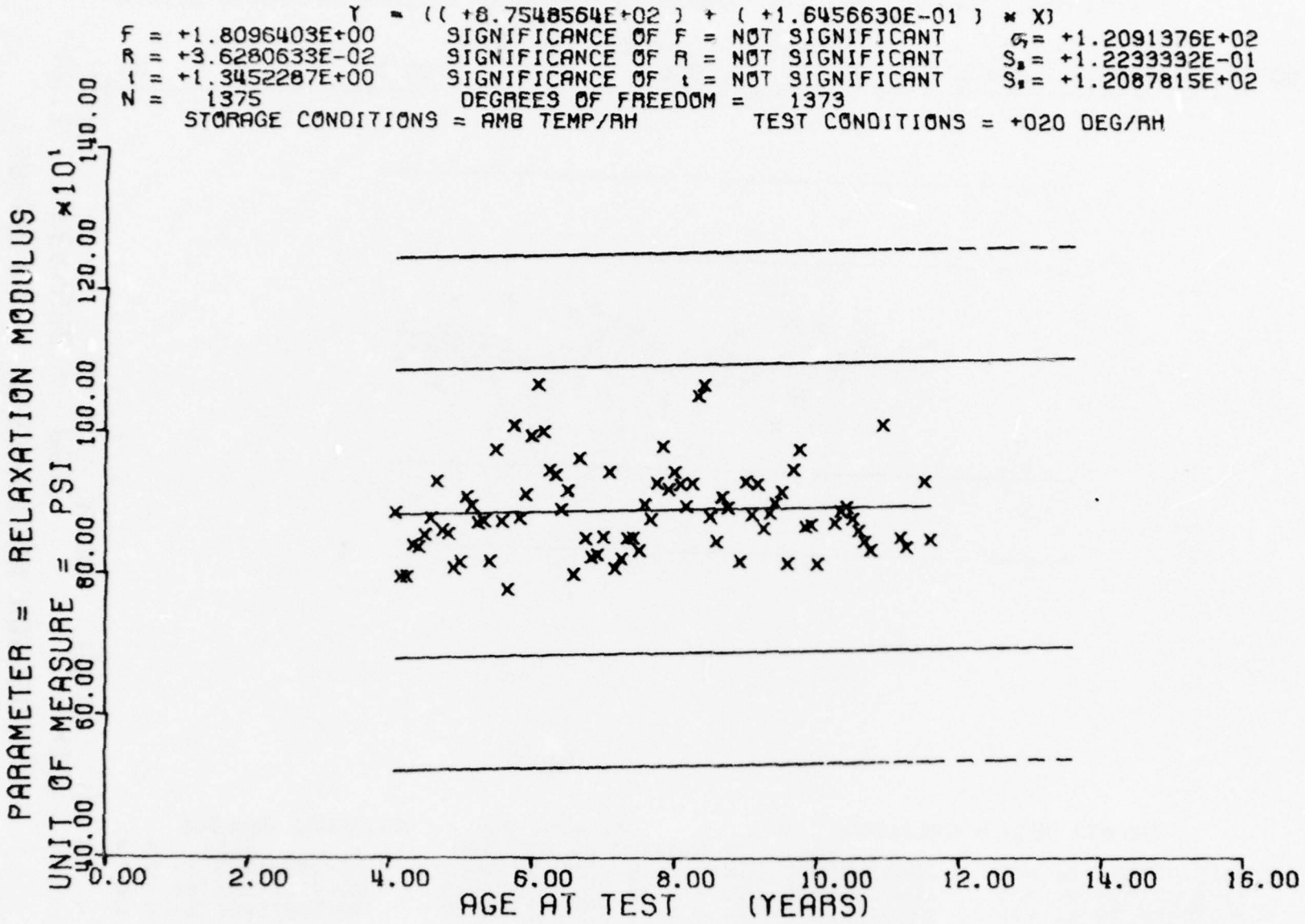

Y = (+1.7413524E+03) + (-5.0733592E-01) * X)
F = +4.3101177E+00 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +2.4175564E+02
R = -5.5940803E-02 SIGNIFICANCE OF R = SIGNIFICANT Sa = +2.4437177E-01
t = +2.0760823E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +2.4146495E+02
N = 1375 DEGREES OF FREEDOM = 1373
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +020 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
80.00
120.00
160.00
200.00
240.00
280.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,10 SEC, 20 DEG F,TPH-1011

Figure 3h



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,50 SEC, 20 DEG F,TPH-1011

Figure 35



WING 6, STRESS RELAXATION MODULUS, 3.0% STRAIN, 100 SEC, 20 DEG F, TPH-1011

Figure 36

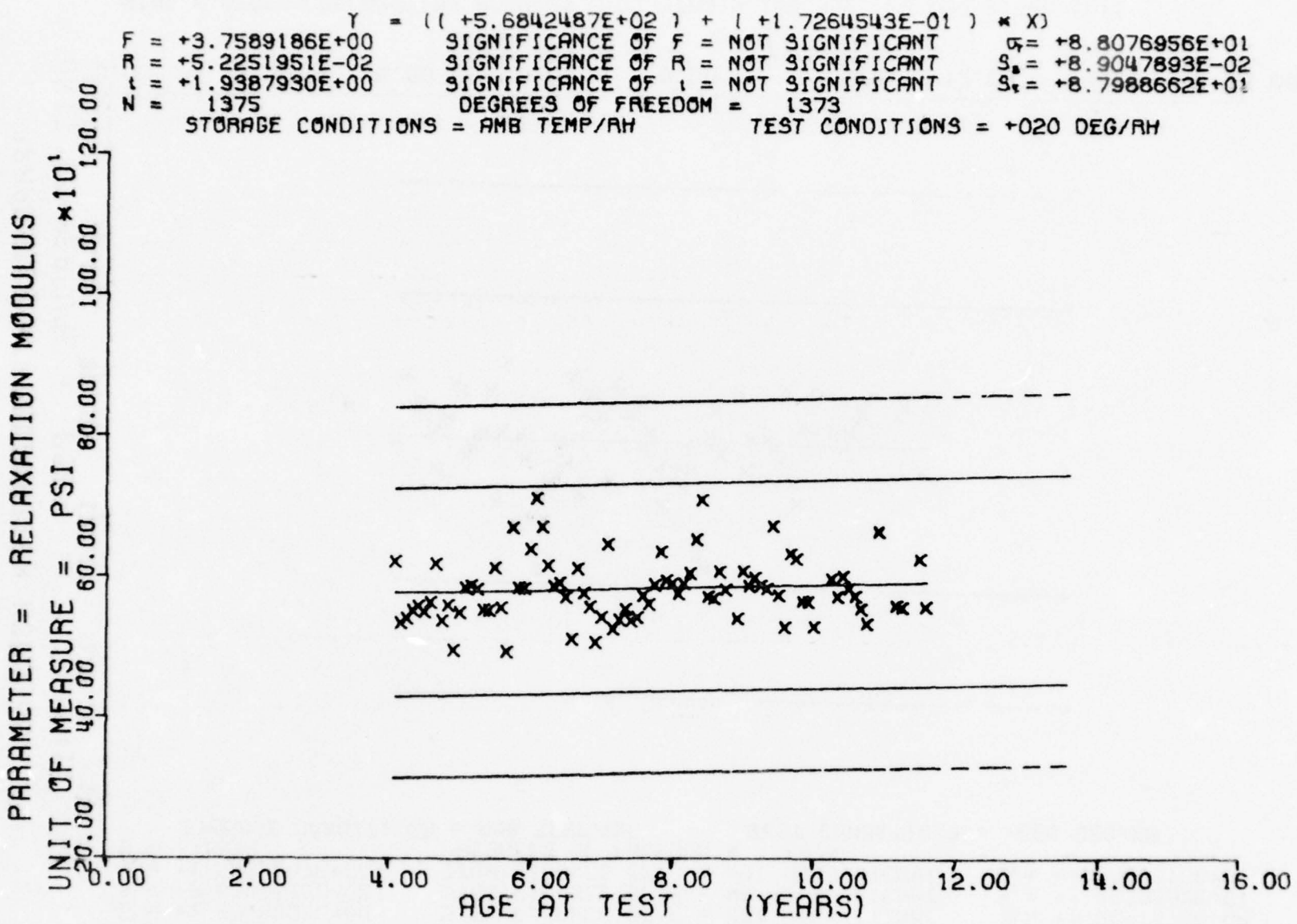

Y = ((+5.6842487E+02) + (+1.7264543E-01) * X)
F = +3.7589186E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +8.8076956E+01
R = +5.2251951E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S = +8.9047893E-02
t = +1.9387930E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S = +8.7988662E+01
N = 1375 DEGREES OF FREEDOM = 1373
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +020 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
120.00
100.00
80.00
60.00
40.00
20.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,1000 SEC, 20 DEG F,TPH-1011

Figure 37

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
2.0	3	27.0	12	53.0	6	78.0	24	103.0	6
3.0	6	28.0	24	54.0	36	79.0	9	104.0	6
4.0	18	29.0	33	55.0	15	80.0	15	105.0	3
5.0	22	30.0	34	56.0	18	81.0	21	107.0	7
6.0	21	31.0	24	57.0	27	82.0	9	108.0	9
7.0	35	32.0	33	58.0	12	83.0	6	109.0	6
8.0	27	33.0	23	59.0	9	84.0	9	110.0	6
9.0	36	34.0	27	60.0	23	85.0	3	111.0	3
10.0	32	35.0	18	61.0	15	86.0	15	112.0	21
11.0	37	36.0	28	62.0	56	87.0	21	113.0	47
12.0	44	38.0	9	63.0	21	88.0	18	114.0	17
13.0	30	39.0	6	64.0	27	89.0	18	115.0	9
14.0	34	40.0	9	65.0	12	90.0	21	116.0	21
15.0	39	41.0	9	66.0	9	91.0	9	117.0	9
16.0	18	42.0	9	67.0	3	92.0	15	118.0	9
17.0	25	43.0	9	68.0	9	93.0	12	119.0	21
18.0	1	44.0	3	69.0	24	94.0	9	120.0	3
19.0	7	45.0	6	70.0	33	95.0	15	123.0	6
20.0	4	46.0	9	71.0	44	96.0	18	124.0	18
21.0	9	47.0	9	72.0	36	97.0	15	125.0	15
22.0	6	48.0	3	73.0	18	98.0	6	126.0	19
23.0	3	49.0	6	74.0	33	99.0	9	127.0	12
24.0	19	50.0	21	75.0	27	100.0	3	128.0	15
25.0	15	51.0	76	76.0	24	101.0	9	129.0	3
26.0	24	52.0	49	77.0	30	102.0	3	131.0	3
								132.0	2
								134.0	24
								135.0	3
								138.0	18
								139.0	39

WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN, SEC, 77 DEG F,TPH-1011

This sample size summary is applicable for figures 38 thru 41.

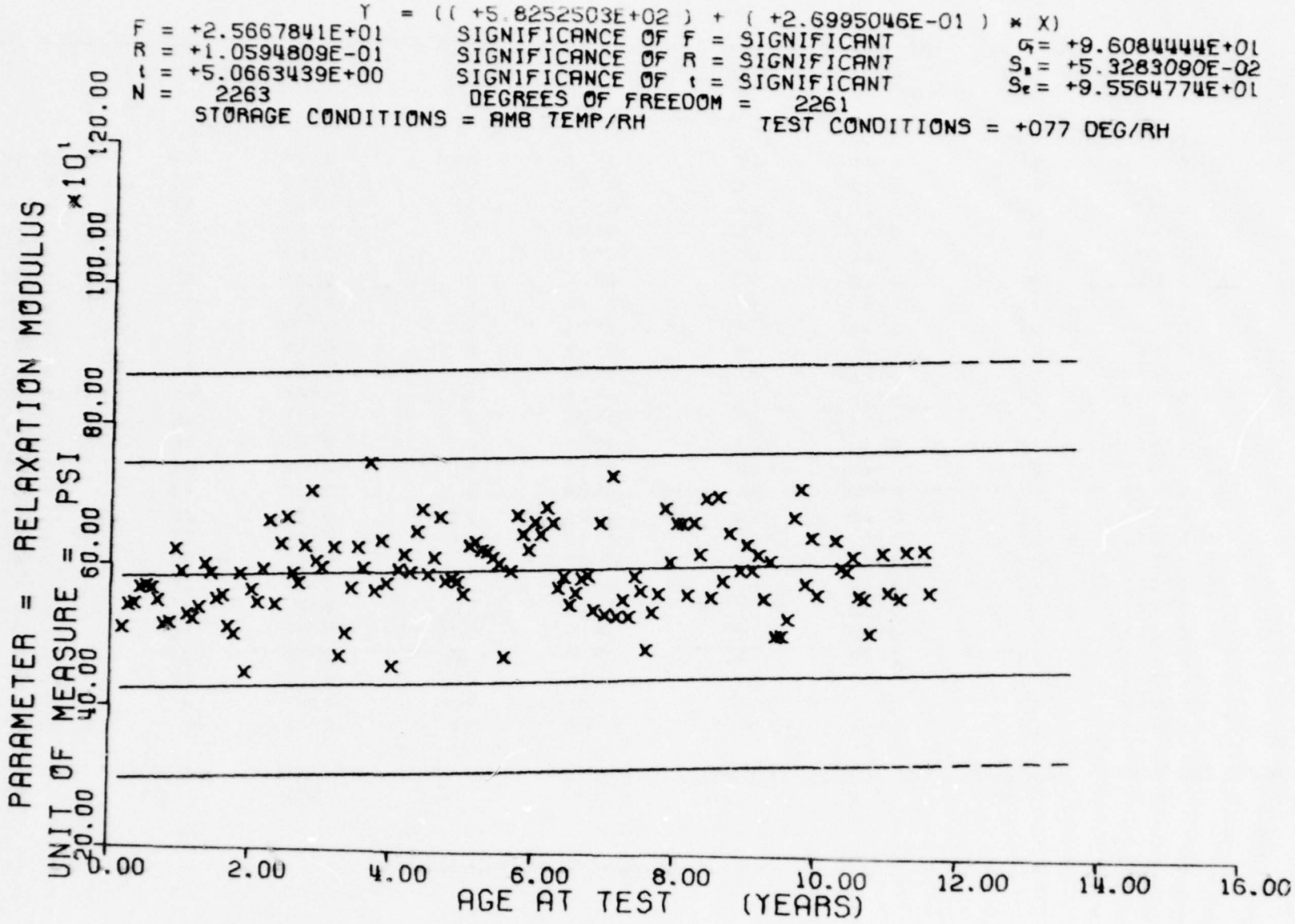
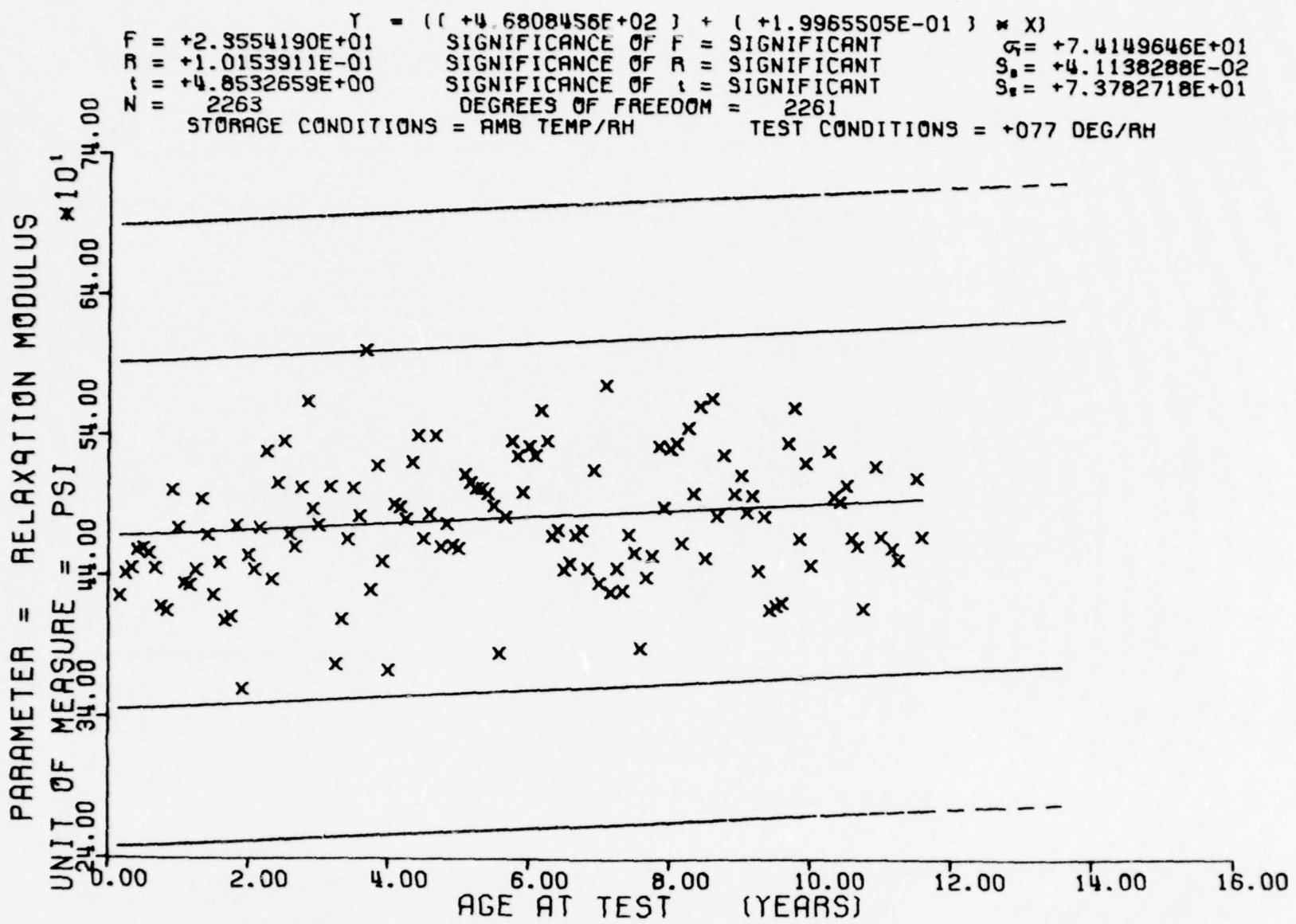

Y = ((+5.8252503E+02) + (+2.6995046E-01) * X)
F = +2.5667841E+01
SIGNIFICANCE OF F = SIGNIFICANT
σ = +9.6084444E+01
R = +1.0594809E-01
SIGNIFICANCE OF R = SIGNIFICANT
Sb = +5.3283090E-02
t = +5.0663439E+00
SIGNIFICANCE OF t = SIGNIFICANT
Se = +9.5564774E+01
N = 2263
DEGREES OF FREEDOM = 2261
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = +077 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
120.00
100.00
80.00
60.00
40.00
20.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,10 SEC, 77 DEG F,TPH-1011

Figure 38



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,50 SEC, 77 DEG F,TPH-1011

Figure 39

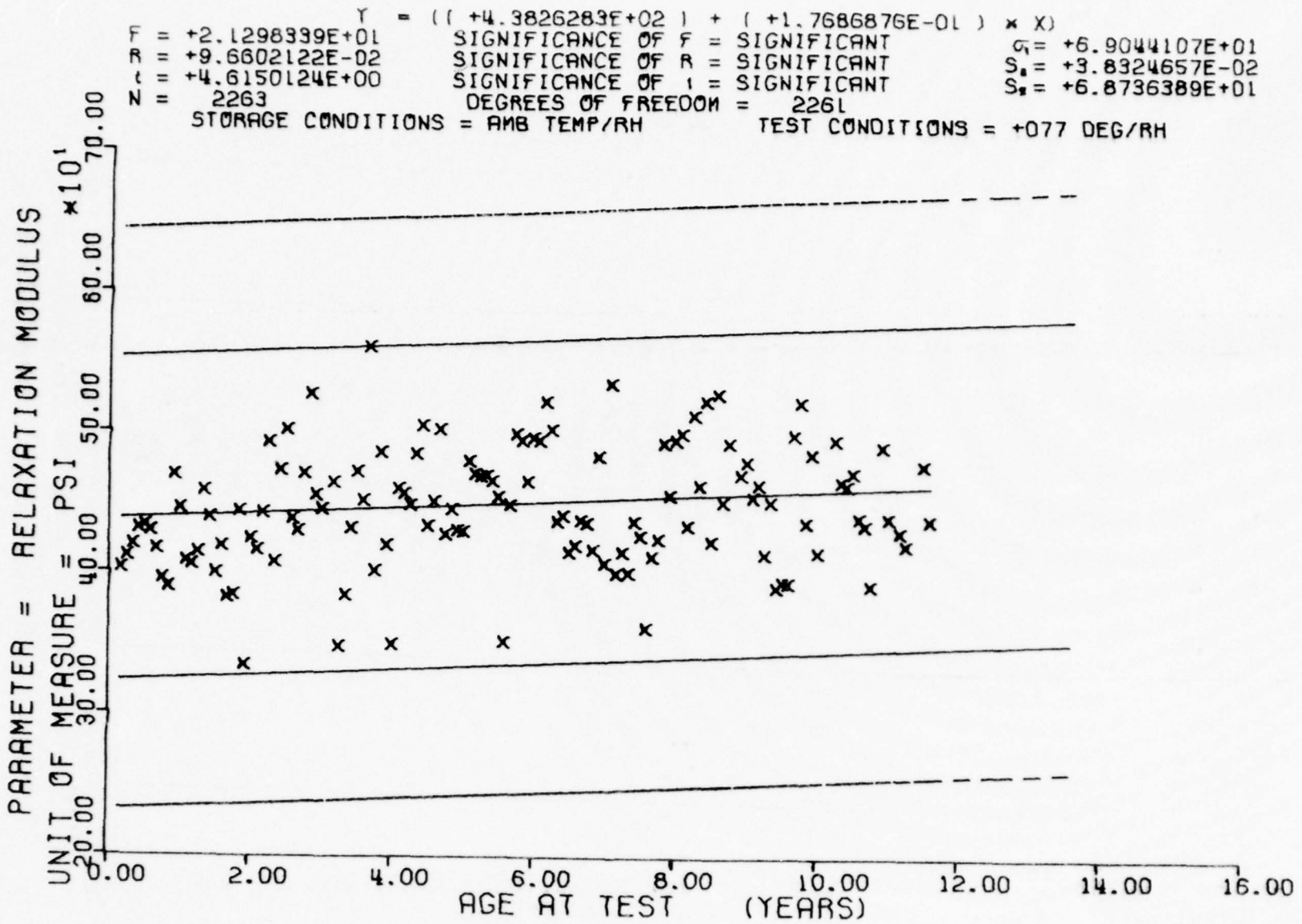

Y = ((+4.3826283E+02) + (+1.7686876E-01) × X)
F = +2.1298339E+01
R = +9.6602122E-02
t = +4.6150124E+00
N = 2263
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 2261
σ1 = +6.9044107E+01
S0 = +3.8324657E-02
S1 = +6.8736389E+01
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = +077 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
70.00
60.00
50.00
40.00
30.00
20.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6, STRESS RELAXATION MODULUS, 3.0% STRAIN, 100 SEC, 77 DEG F, TPH-1011

Figure 40

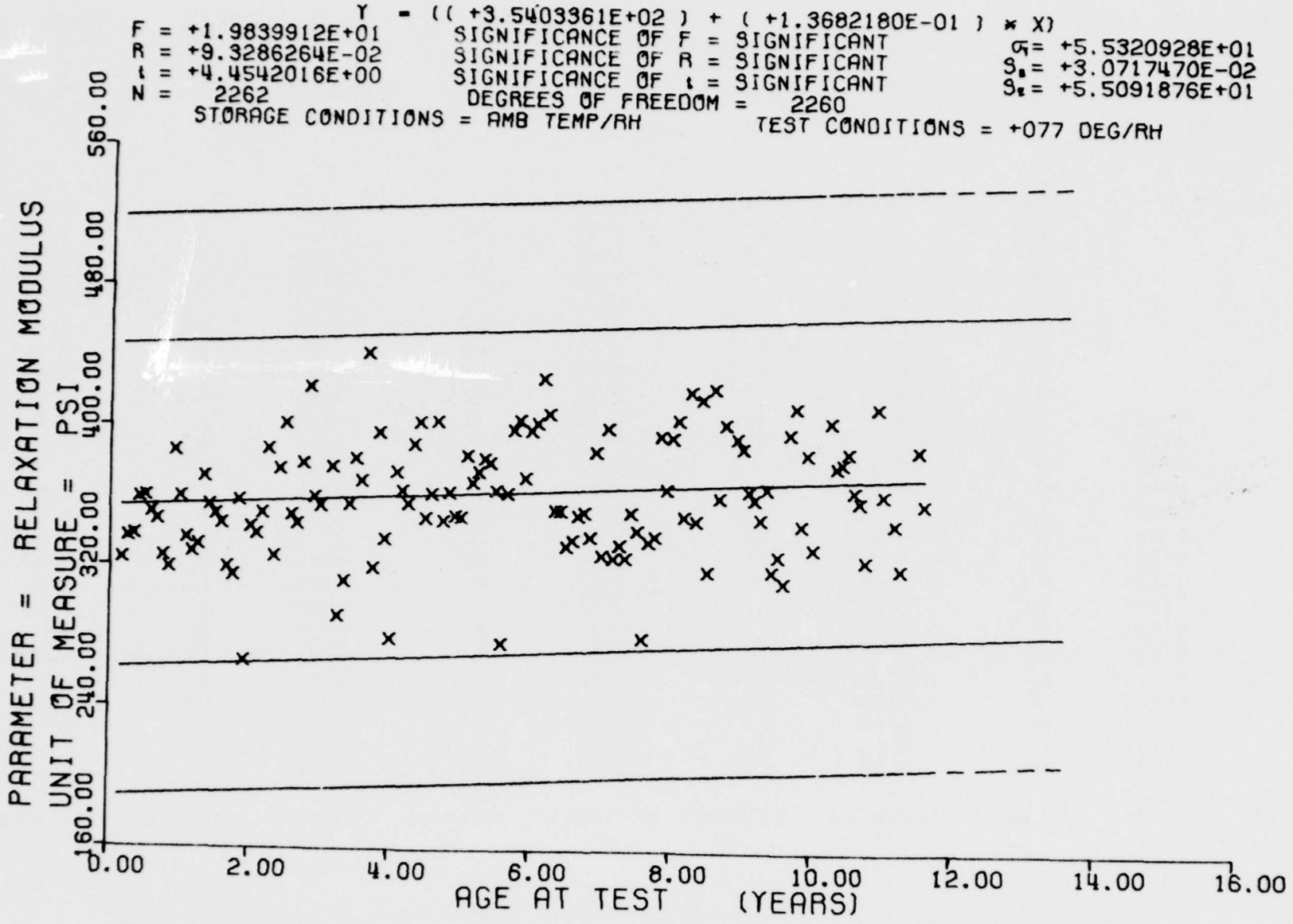

Y = ((+3.5403361E+02) + (+1.3682180E-01) * X)
F = +1.9839912E+01
R = +9.3286264E-02
t = +4.4542016E+00
N = 2262
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 2260
σ = +5.5320928E+01
S_a = +3.0717470E-02
S_e = +5.5091876E+01
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = +077 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI
560.00
480.00
400.00
320.00
240.00
160.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,1000 SEC, 77 DEG F,TPH-1011

Figure 41

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
12.0	3	41.0	12	66.0	12	91.0	12	117.0	9
13.0	3	42.0	6	67.0	3	92.0	15	118.0	9
15.0	6	43.0	9	68.0	9	93.0	15	119.0	21
17.0	15	44.0	3	69.0	24	94.0	12	120.0	3
19.0	6	45.0	9	70.0	27	95.0	15	123.0	9
20.0	3	46.0	6	71.0	45	96.0	15	124.0	15
21.0	9	47.0	9	72.0	39	97.0	9	125.0	15
22.0	6	48.0	3	73.0	18	98.0	9	126.0	18
23.0	3	49.0	6	74.0	36	99.0	6	127.0	12
24.0	6	50.0	27	75.0	24	100.0	3	128.0	15
25.0	9	51.0	57	76.0	26	101.0	6	129.0	3
26.0	9	52.0	42	77.0	30	102.0	6	130.0	3
28.0	3	53.0	12	78.0	21	103.0	6	134.0	24
29.0	9	54.0	28	79.0	9	104.0	6	135.0	3
30.0	9	55.0	18	80.0	15	105.0	3	138.0	27
31.0	3	56.0	21	81.0	18	107.0	5	139.0	39
32.0	9	57.0	22	82.0	9	108.0	9		
33.0	9	58.0	15	83.0	9	109.0	6		
34.0	3	59.0	12	84.0	9	110.0	6		
35.0	15	60.0	15	85.0	3	111.0	3		
36.0	24	61.0	20	86.0	9	112.0	24		
37.0	3	62.0	48	87.0	6	113.0	36		
38.0	6	63.0	21	88.0	11	114.0	18		
39.0	9	64.0	30	89.0	6	115.0	9		
40.0	9	65.0	9	90.0	15	116.0	21		

WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN, SEC,100 DEG F,TPH-1011

This sample size summary is applicable for figures 42 thru 45.

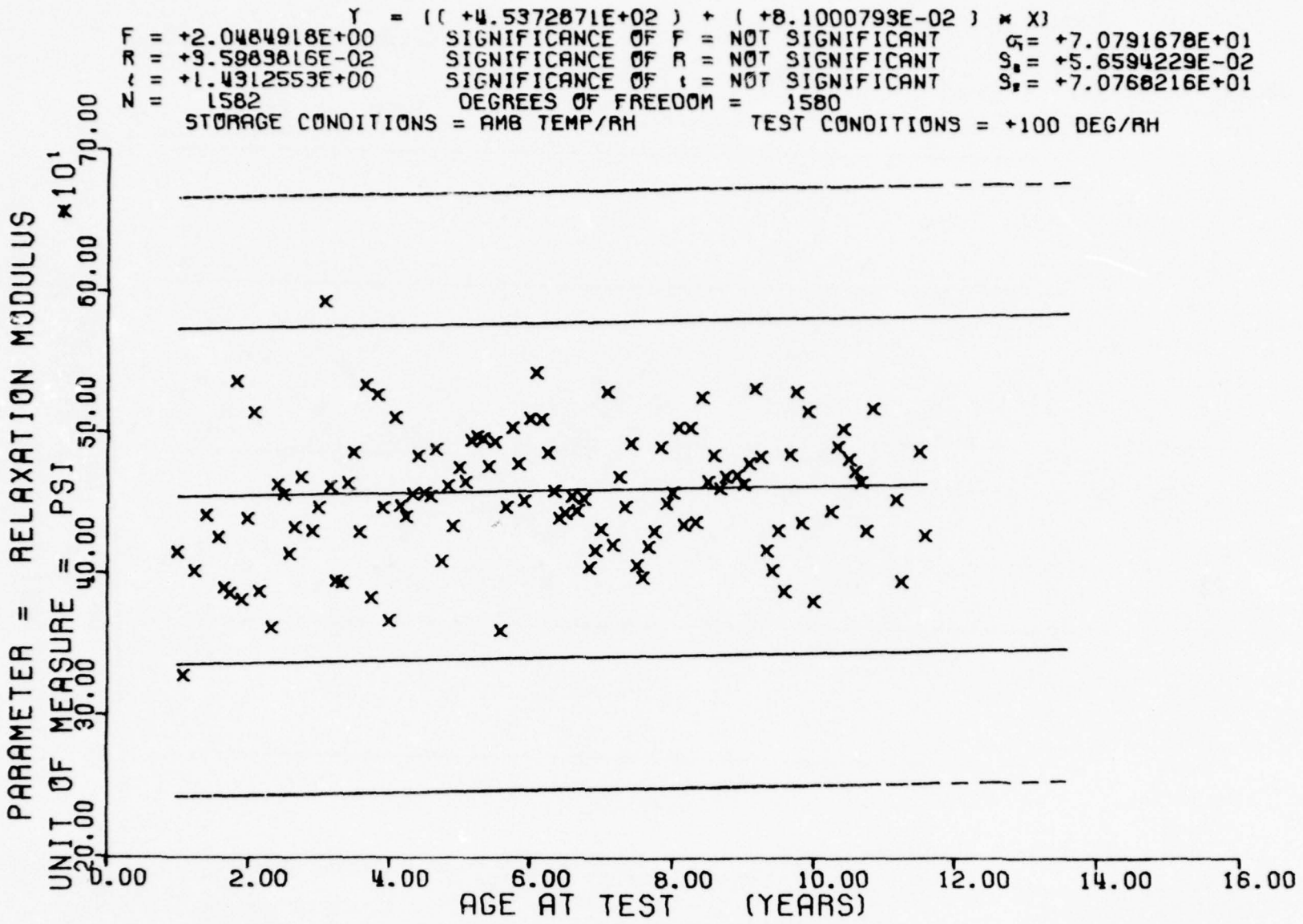
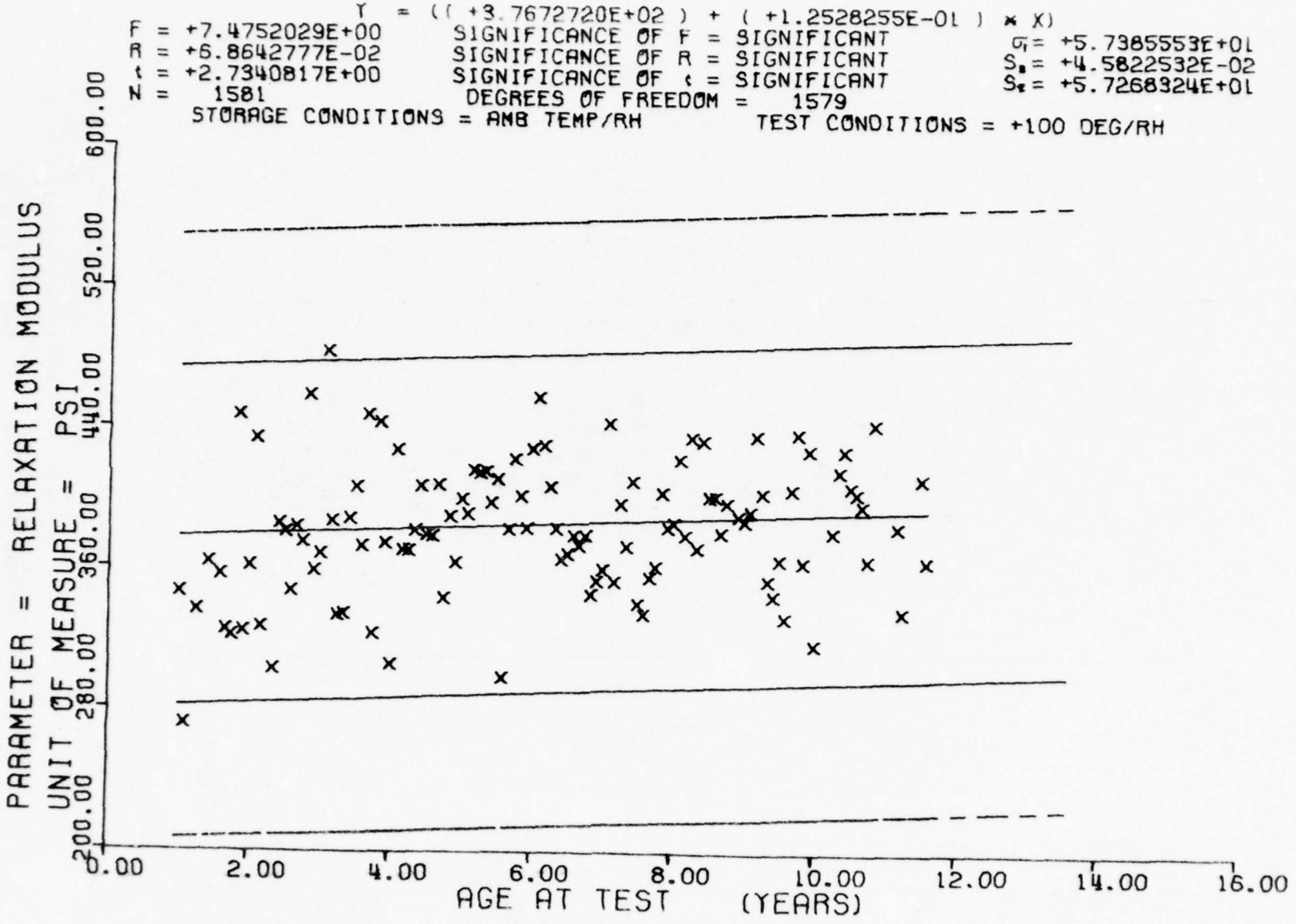

Y = ((+4.5372871E+02) + (+8.1000793E-02) * X)
F = +2.0484918E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +7.0791678E+01
R = +9.5989816E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S = +5.6594229E-02
t = +1.4312553E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S = +7.0768216E+01
N = 1582 DEGREES OF FREEDOM = 1580
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +100 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
20.00
30.00
40.00
50.00
60.00
70.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,10 SEC,100 DEG F,TPH-1011

Figure 42



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,50 SEC,100 DEG F,TPH-1011

Figure 43

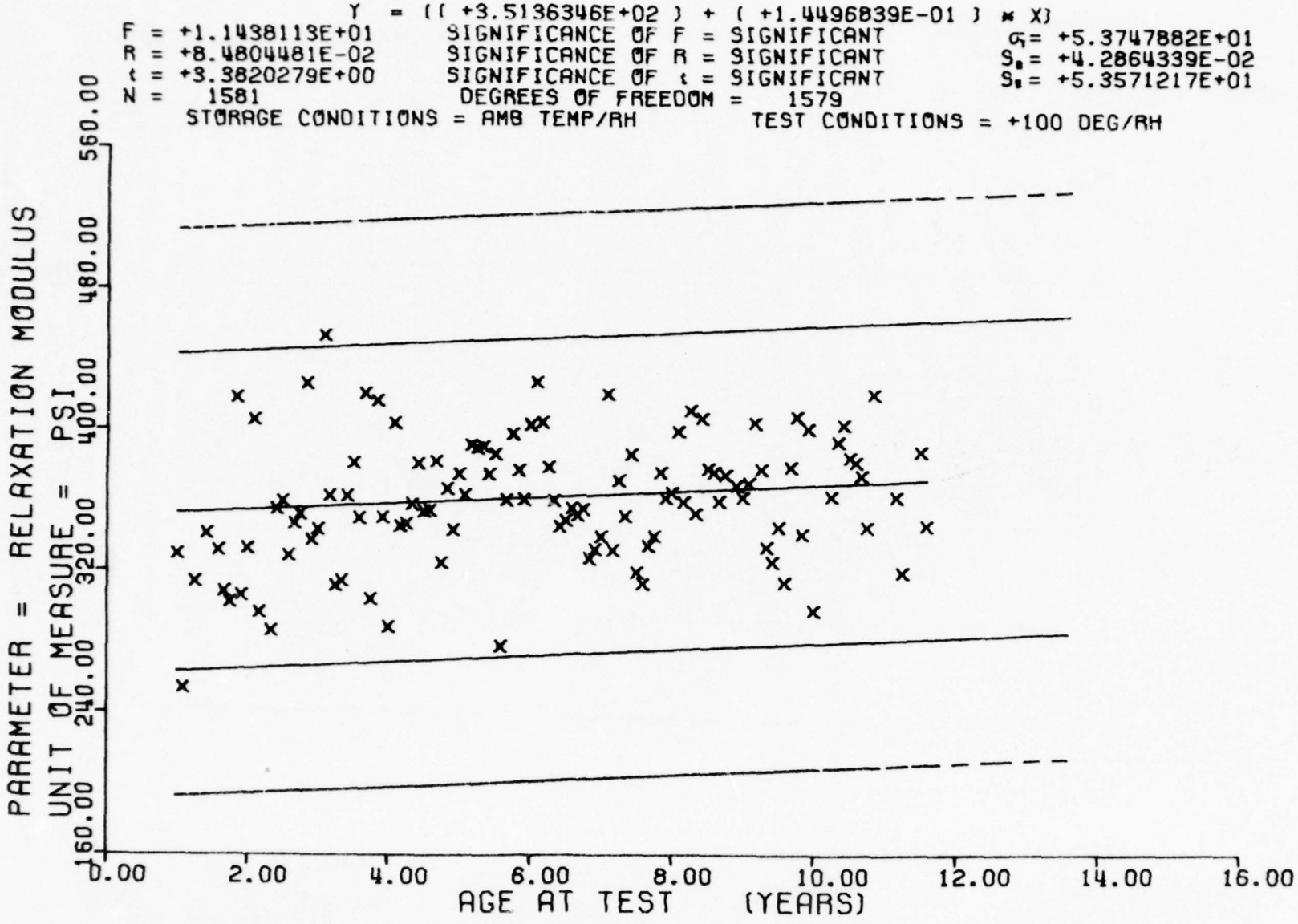
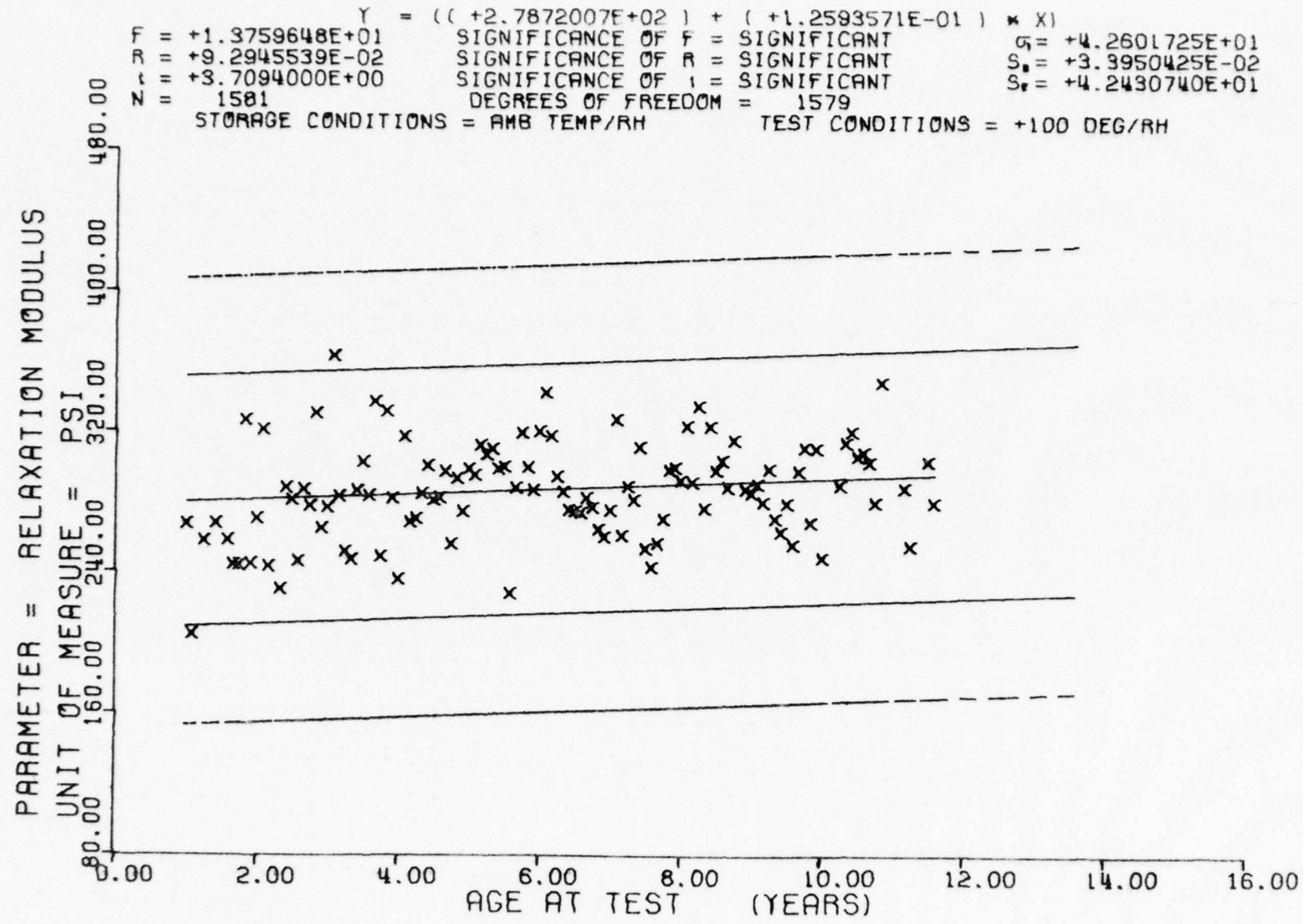

Y = ((+3.5136346E+02) + (+1.4496839E-01) * X)
F = +1.1438113E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +5.3747882E+01
R = +8.4804481E-02 SIGNIFICANCE OF R = SIGNIFICANT S_b = +4.2864339E-02
t = +3.3820279E+00 SIGNIFICANCE OF t = SIGNIFICANT S_e = +5.3571217E+01
N = 1581 DEGREES OF FREEDOM = 1579
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +100 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI
160.00
240.00
320.00
400.00
480.00
560.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,100 SEC,100 DEG F,TPH-1011

Figure 44



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,1000 SEC,100 DEG F,TPH-1011

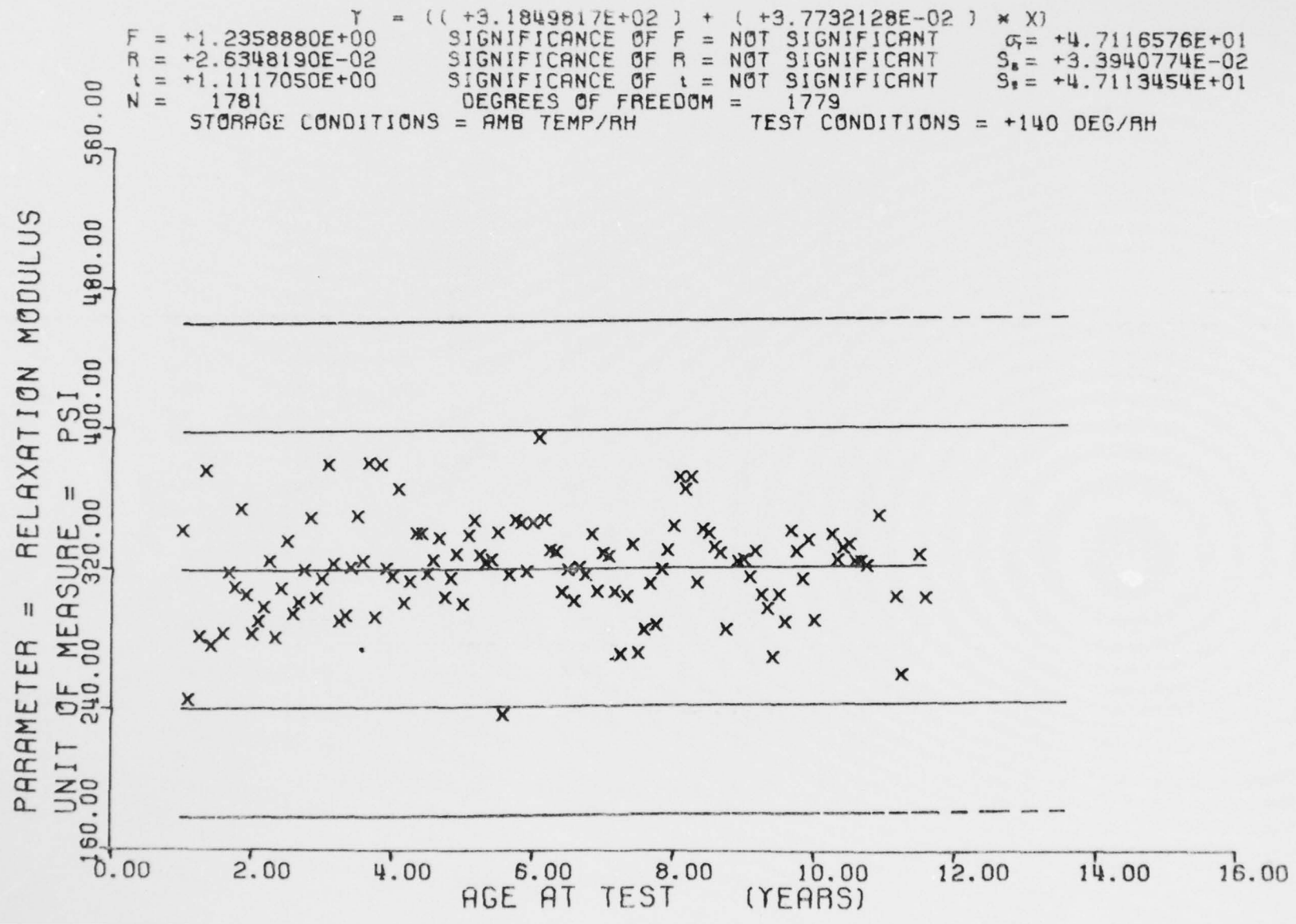
Figure 45

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
12.0	3	39.0	12	64.0	30	89.0	6	115.0	9
13.0	3	40.0	9	65.0	9	90.0	12	116.0	21
15.0	6	41.0	6	66.0	12	91.0	15	117.0	9
16.0	3	42.0	12	67.0	3	92.0	12	118.0	15
17.0	12	43.0	9	68.0	9	93.0	15	119.0	21
19.0	6	44.0	3	69.0	27	94.0	15	120.0	3
20.0	6	45.0	3	70.0	15	95.0	14	123.0	9
21.0	6	46.0	6	71.0	51	96.0	15	124.0	15
22.0	3	47.0	9	72.0	39	97.0	9	125.0	15
23.0	6	48.0	6	73.0	18	98.0	9	126.0	18
24.0	18	49.0	6	74.0	32	99.0	6	127.0	12
25.0	18	50.0	27	75.0	24	100.0	3	128.0	12
26.0	18	51.0	60	76.0	30	101.0	6	129.0	2
27.0	15	52.0	51	77.0	30	102.0	5	131.0	3
28.0	21	53.0	12	78.0	21	103.0	6	134.0	24
29.0	33	54.0	27	79.0	8	104.0	3	135.0	3
30.0	36	55.0	18	80.0	14	105.0	3	138.0	18
31.0	24	56.0	18	81.0	15	107.0	6	139.0	42
32.0	33	57.0	24	82.0	9	108.0	9		
33.0	21	58.0	15	83.0	9	109.0	6		
34.0	33	59.0	9	84.0	9	110.0	6		
35.0	18	60.0	17	85.0	3	111.0	3		
36.0	21	61.0	24	86.0	9	112.0	21		
37.0	3	62.0	48	87.0	12	113.0	36		
38.0	3	63.0	21	88.0	12	114.0	18		

WING 6.STRESS RELAXATION MODULUS.3.0% STRAIN. SEC.140 DEG F.TPH-1011

This sample size summary is applicable for figures 46 thru 49.


Y = ((+3.1849817E+02) + (+3.7732128E-02) * X)
F = +1.2358880E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +4.7116576E+01
R = +2.6348190E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +3.3940774E-02
t = +1.1117050E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +4.7113454E+01
N = 1781 DEGREES OF FREEDOM = 1779
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +140 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI
160.00
240.00
320.00
400.00
480.00
560.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)

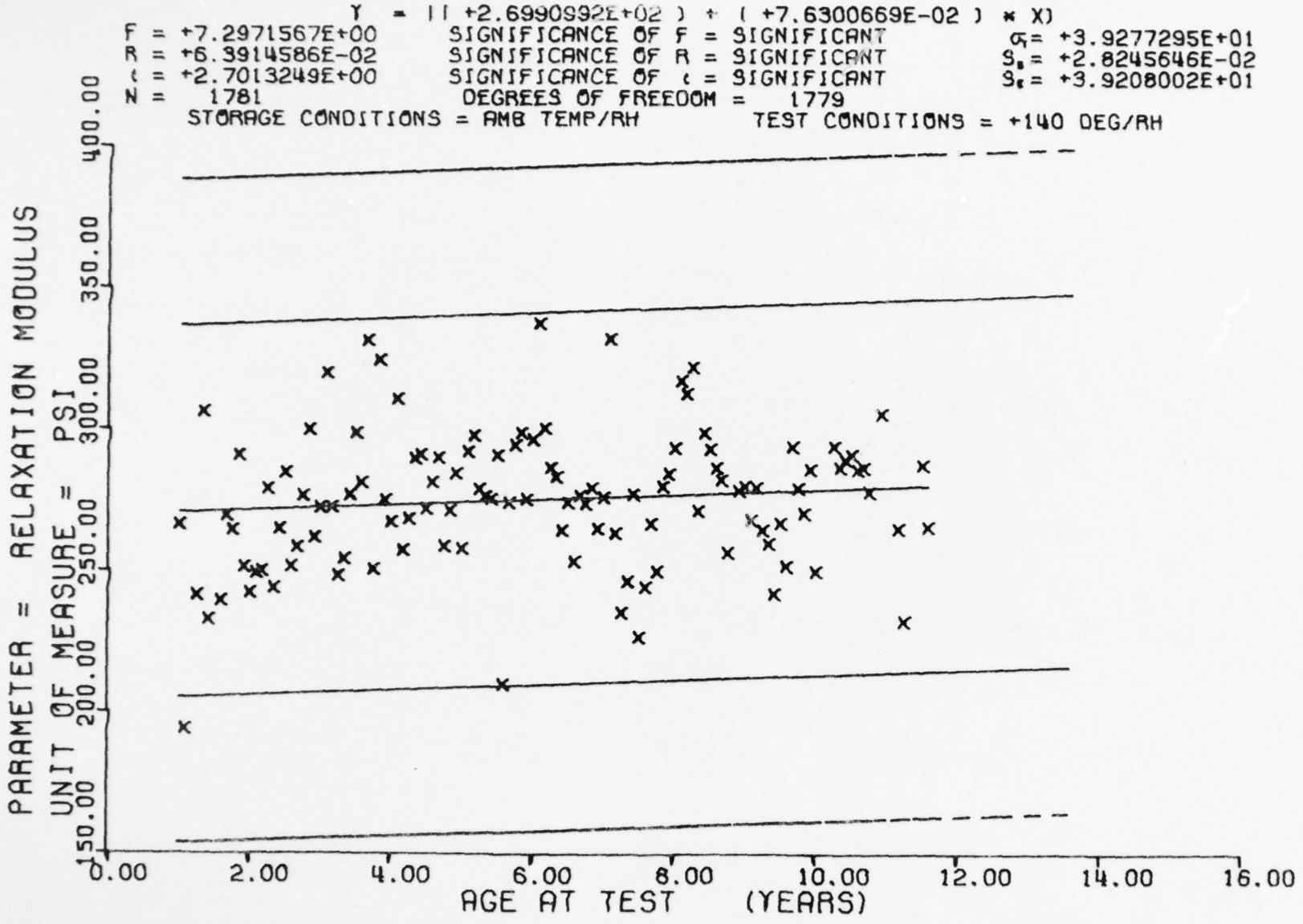

Y = (+2.6990892E+02) + (+7.6300669E-02) * X)
F = +7.2971567E+00 SIGNIFICANCE OF F = SIGNIFICANT σ = +3.9277295E+01
R = +6.3914586E-02 SIGNIFICANCE OF R = SIGNIFICANT S = +2.8245646E-02
t = +2.7013249E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +3.9208002E+01
N = 1781 DEGREES OF FREEDOM = 1779
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +140 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI
400.00
350.00
300.00
250.00
200.00
150.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,50 SEC,140 DEG F,TPH-1011

Figure 47

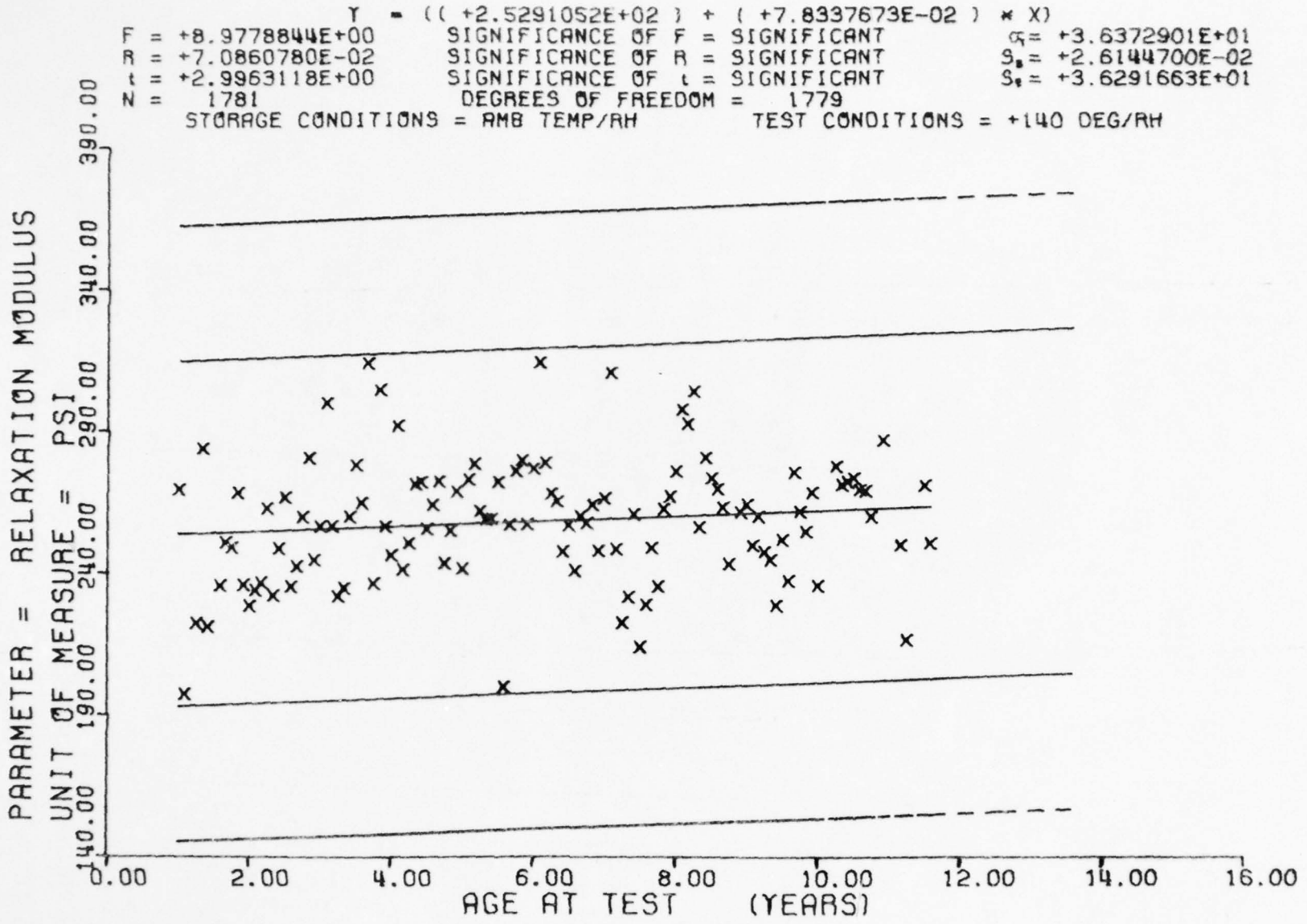

Y = ((+2.5291052E+02) + (+7.8337673E-02) * X)
F = +8.9778844E+00 SIGNIFICANCE OF F = SIGNIFICANT σ = +3.6372901E+01
R = +7.0860780E-02 SIGNIFICANCE OF R = SIGNIFICANT S_b = +2.6144700E-02
t = +2.9963118E+00 SIGNIFICANCE OF t = SIGNIFICANT S_e = +3.6291663E+01
N = 1781 DEGREES OF FREEDOM = 1779
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +140 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI
140.00
190.00
240.00
290.00
340.00
390.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6, STRESS RELAXATION MODULUS, 3.0% STRAIN, 100 SEC, 140 DEG F, TPH-1011

Figure 48

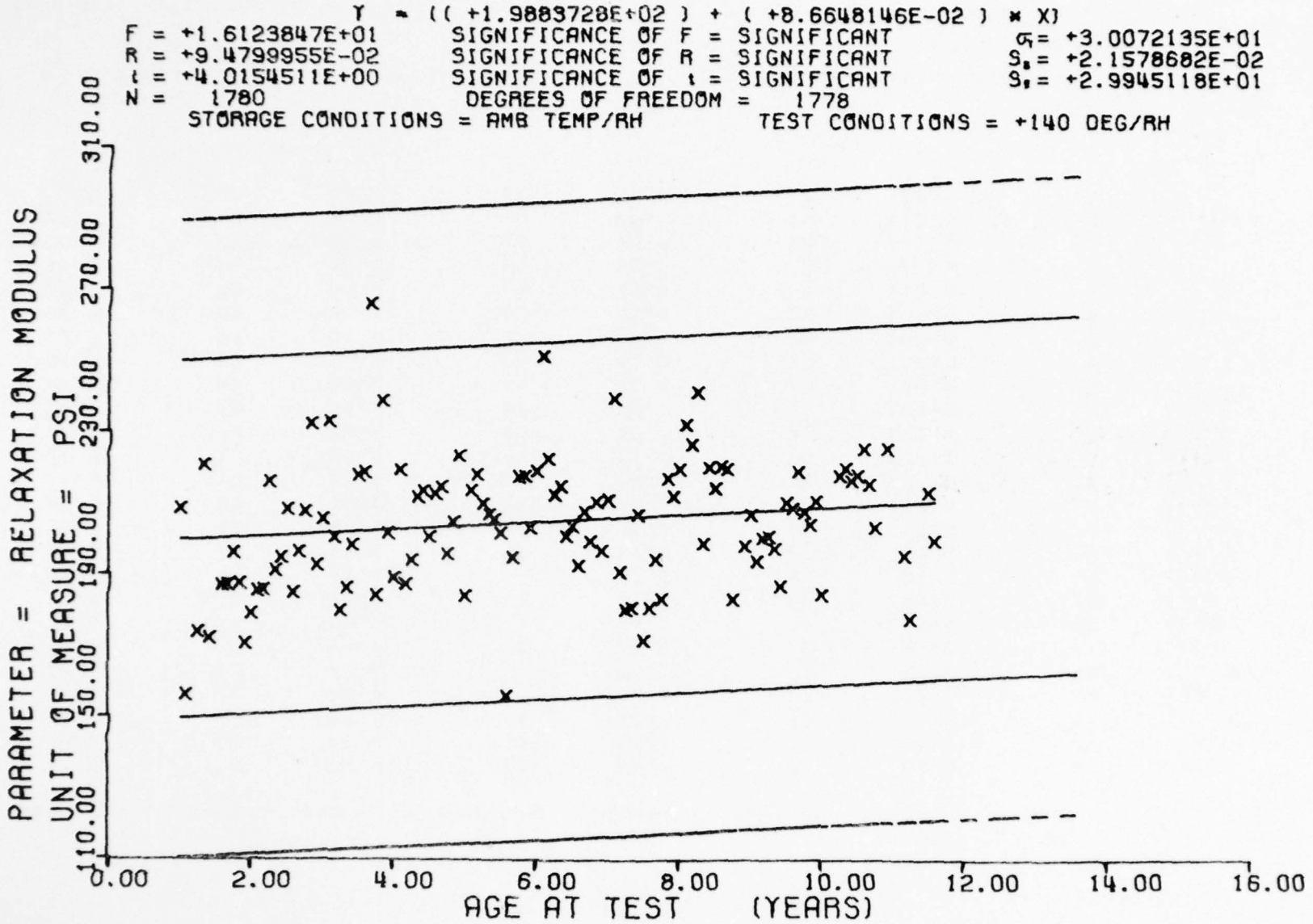

Y = ((+1.9883728E+02) + (+8.6648146E-02) * X)
F = +1.6123847E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +3.0072135E+01
R = +9.4799955E-02 SIGNIFICANCE OF R = SIGNIFICANT S = +2.1578682E-02
t = +4.0154511E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +2.9945118E+01
N = 1780 DEGREES OF FREEDOM = 1778
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +140 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI
310.00
270.00
230.00
190.00
150.00
110.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,1000 SEC,140 DEG F,TPH-1011

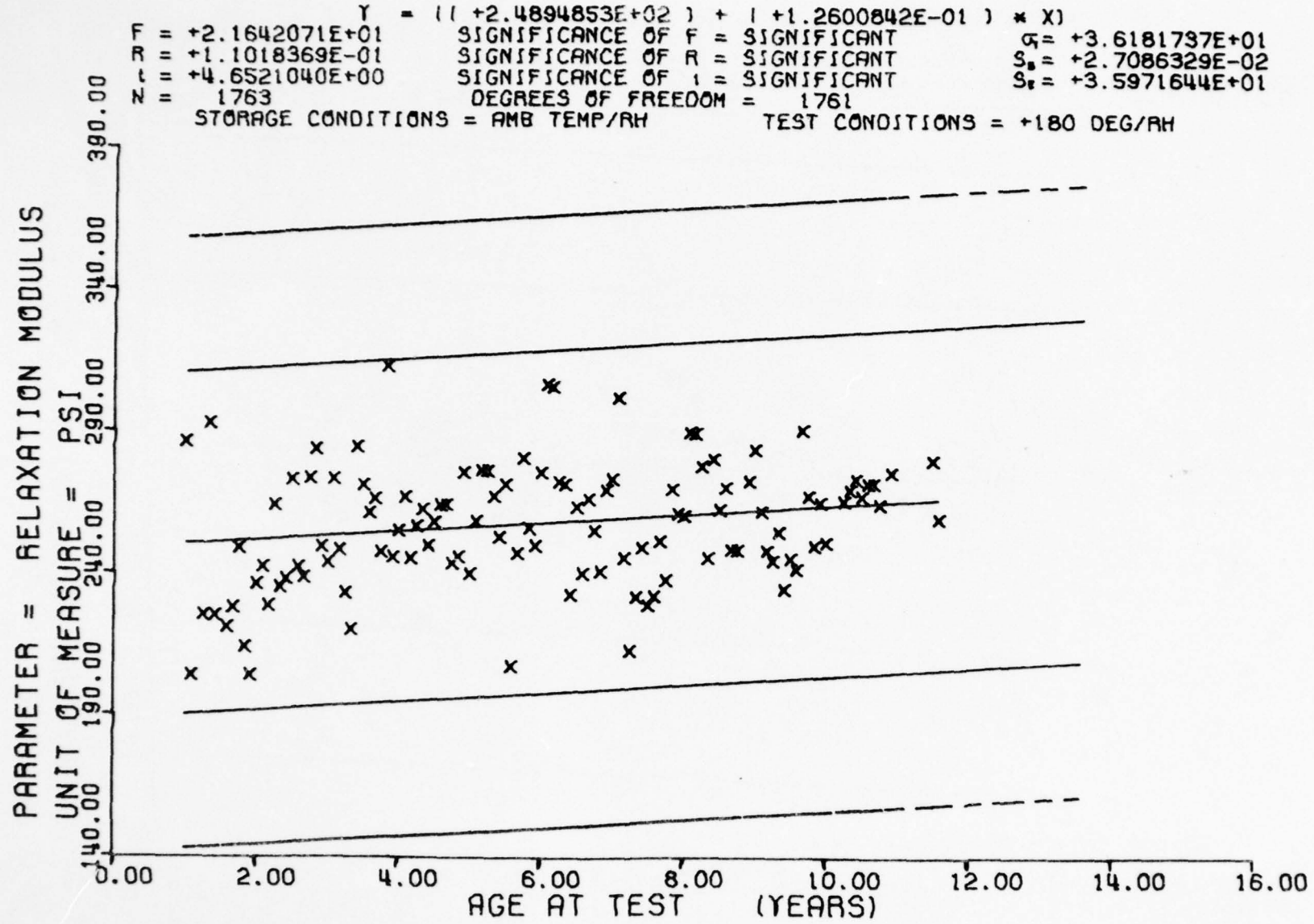
Figure 49

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
12.0	3	39.0	12	64.0	27	89.0	21	115.0	9
13.0	3	40.0	9	65.0	12	90.0	21	116.0	21
15.0	6	41.0	6	66.0	12	91.0	15	117.0	9
16.0	3	42.0	12	67.0	3	92.0	12	118.0	8
17.0	12	43.0	9	68.0	9	93.0	15	119.0	15
19.0	6	44.0	3	69.0	18	94.0	14	120.0	3
20.0	6	45.0	6	70.0	20	95.0	15	123.0	9
21.0	6	46.0	3	71.0	27	96.0	15	124.0	15
22.0	3	47.0	12	72.0	45	97.0	9	125.0	15
23.0	6	48.0	6	73.0	21	98.0	9	126.0	18
24.0	18	49.0	6	74.0	30	99.0	6	127.0	12
25.0	20	50.0	27	75.0	27	100.0	3	128.0	9
26.0	15	51.0	51	76.0	33	101.0	6	129.0	6
27.0	15	52.0	50	77.0	24	102.0	6	131.0	3
28.0	23	53.0	15	78.0	27	103.0	6	138.0	9
29.0	29	54.0	27	79.0	9	104.0	3	139.0	41
30.0	33	55.0	15	80.0	15	105.0	6		
31.0	27	56.0	18	81.0	18	107.0	6		
32.0	33	57.0	27	82.0	6	108.0	9		
33.0	21	58.0	15	83.0	12	109.0	6		
34.0	30	59.0	9	84.0	9	110.0	6		
35.0	15	60.0	15	85.0	3	111.0	3		
36.0	27	61.0	24	86.0	12	112.0	24		
37.0	3	62.0	46	87.0	15	113.0	39		
38.0	3	63.0	21	88.0	27	114.0	15		

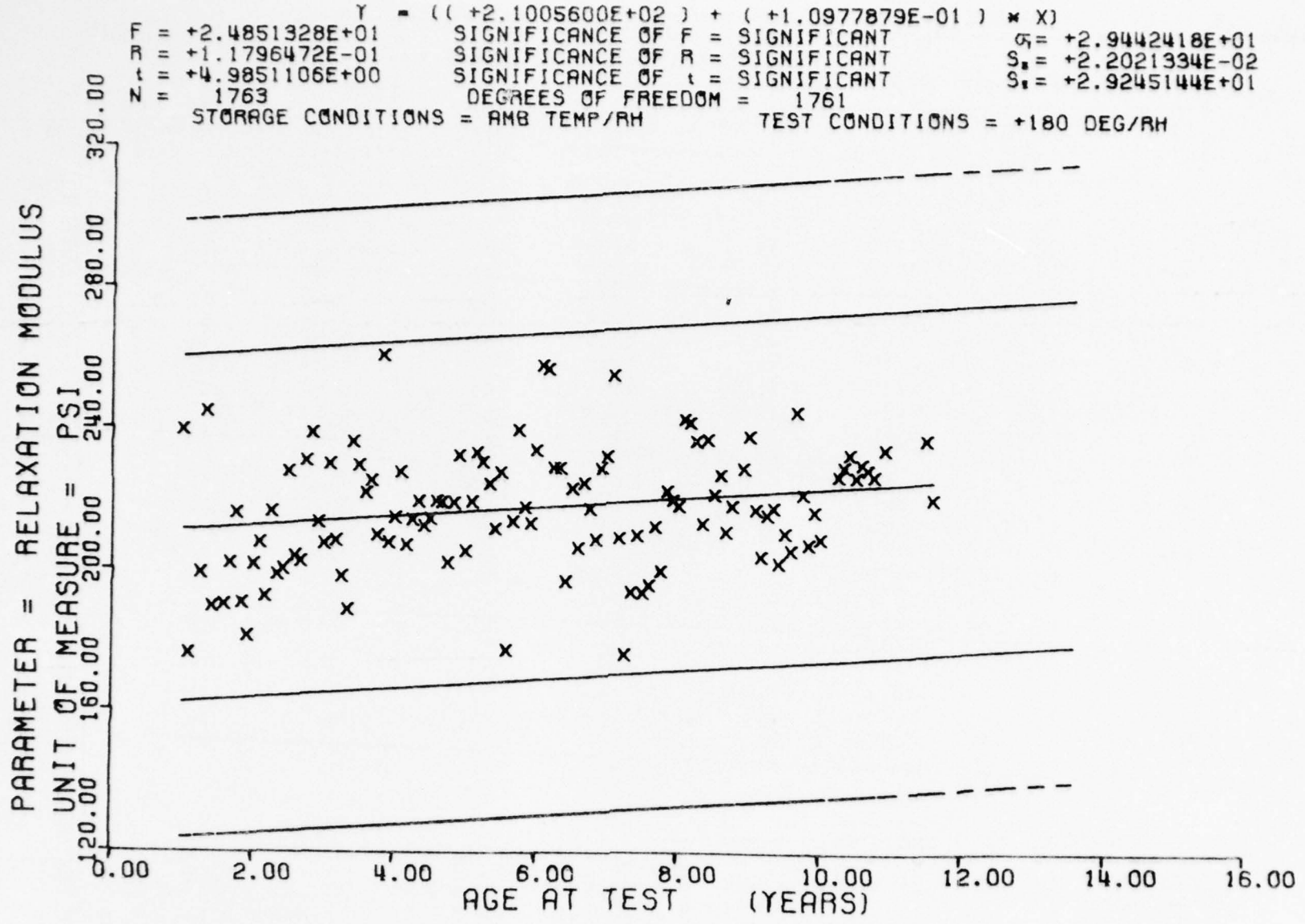
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN, SEC,180 DEG F,TPH-1011

This sample size summary is applicable for figures 50 thru 53.



WING 6, STRESS RELAXATION MODULUS, 3.0% STRAIN, 10 SEC, 180 DEG F, TPH-1011

Figure 50



WING 6, STRESS RELAXATION MODULUS, 3.0% STRAIN, 50 SEC, 180 DEG F, TPH-1011

Figure 51

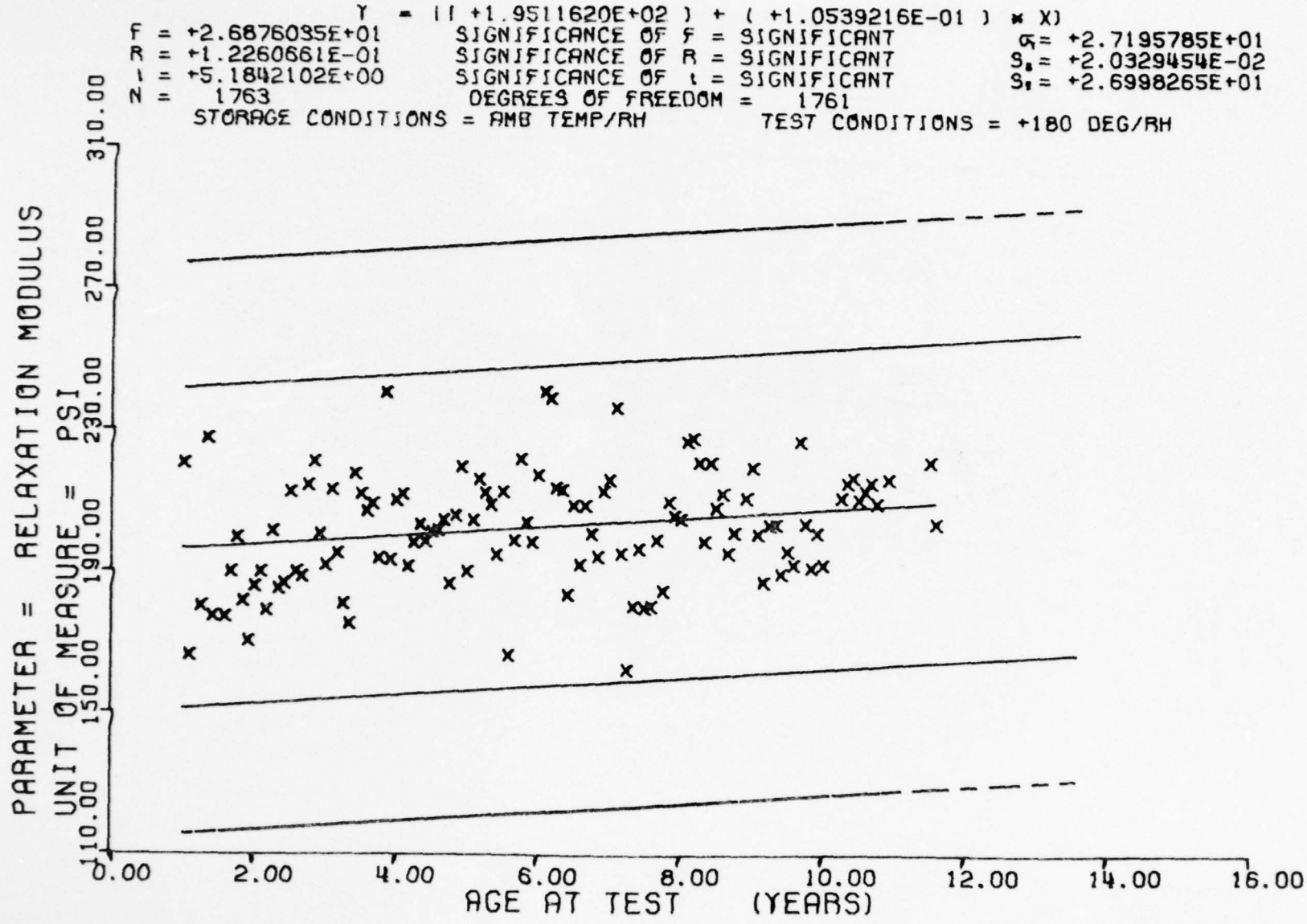
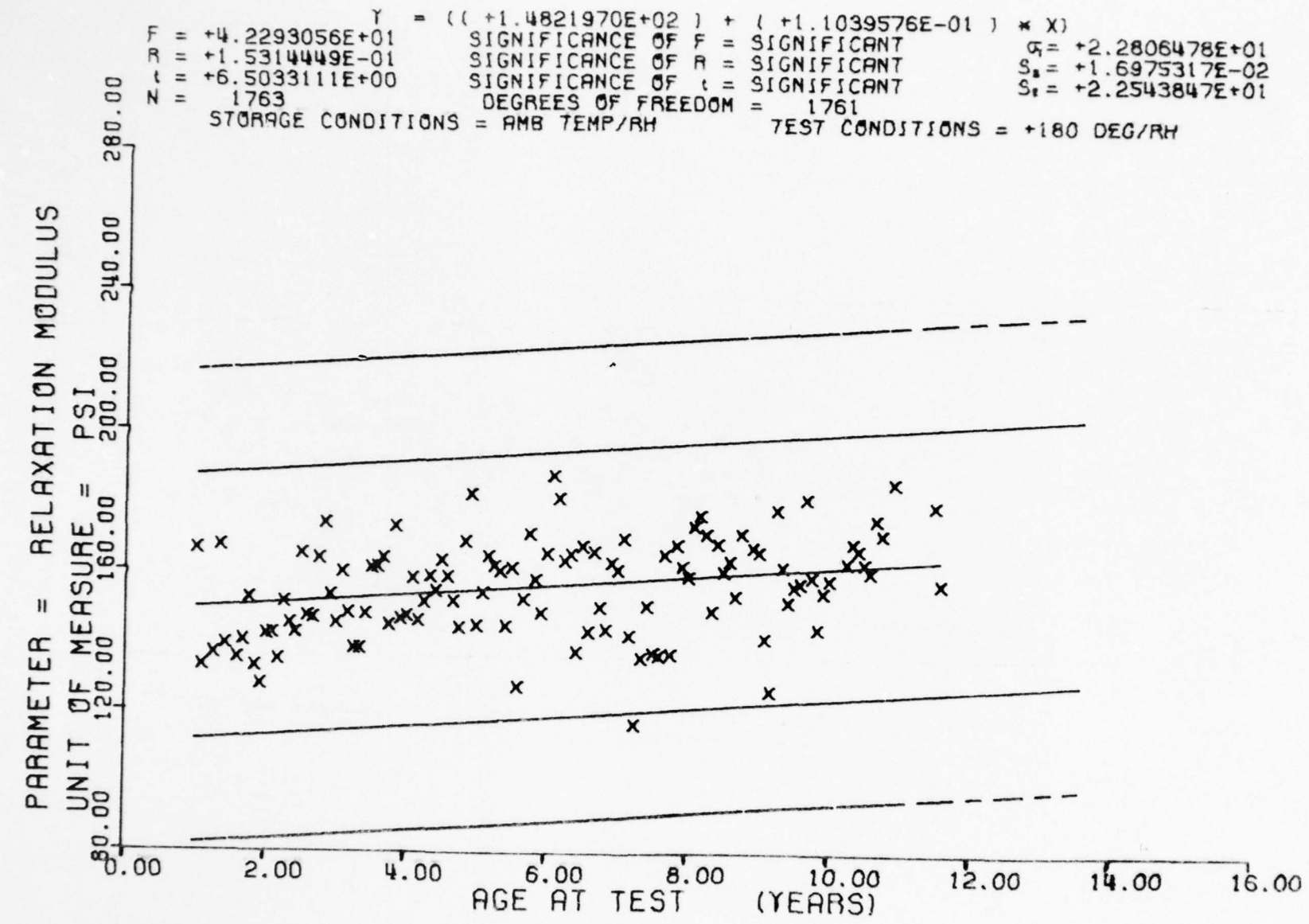

Y = (+1.9511620E+02) + (+1.0539216E-01) * X)
F = +2.6876035E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +2.7195785E+01
R = +1.2260661E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +2.0329454E-02
t = +5.1842102E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +2.6998265E+01
N = 1763 DEGREES OF FREEDOM = 1761
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +180 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI
310.00
270.00
230.00
190.00
150.00
110.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6, STRESS RELAXATION MODULUS, 3.0% STRAIN, 100 SEC, 180 DEG F, TPH-101

Figure 52



WING 6, STRESS RELAXATION MODULUS, 3.0% STRAIN, 1000 SEC, 180 DEG F, TPH-1011

Figure 53

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
24.0	10	52.0	15	78.0	16	104.0	3
25.0	25	53.0	20	79.0	5	105.0	3
26.0	10	54.0	10	80.0	20	109.0	3
27.0	5	55.0	10	81.0	15		
28.0	10	56.0	18	82.0	8		
29.0	15	58.0	20	83.0	20		
30.0	5	59.0	16	84.0	10		
31.0	21	60.0	15	85.0	19		
32.0	10	61.0	27	86.0	11		
33.0	26	62.0	8	87.0	10		
34.0	10	63.0	15	88.0	10		
35.0	12	64.0	17	89.0	3		
36.0	8	65.0	15	90.0	15		
37.0	28	66.0	5	91.0	20		
38.0	17	67.0	20	92.0	12		
39.0	15	68.0	20	93.0	8		
40.0	18	69.0	5	94.0	10		
42.0	12	70.0	15	95.0	8		
43.0	15	71.0	28	96.0	18		
44.0	10	72.0	15	97.0	6		
46.0	10	73.0	8	98.0	10		
47.0	15	74.0	10	99.0	5		
48.0	13	75.0	15	101.0	3		
49.0	25	76.0	20	102.0	11		
50.0	14	77.0	20	103.0	3		

STAGE 1 WING 6 TP-H 1011 CONSTANT STRAIN

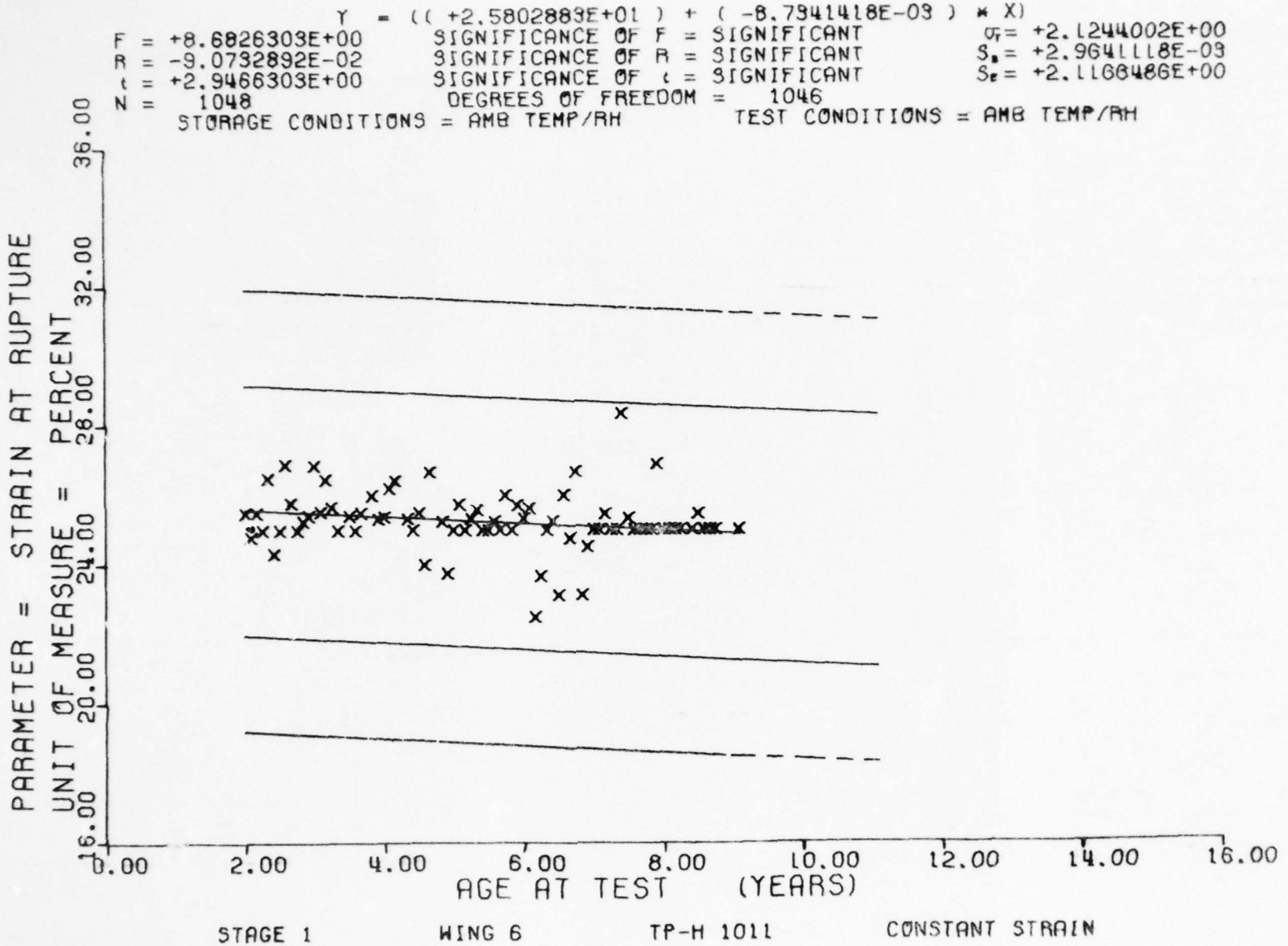

Y = ((+2.5802883E+01) + (-8.7941418E-03) * X)
F = +8.6826303E+00 SIGNIFICANCE OF F = SIGNIFICANT
R = -9.0732892E-02 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.9466303E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 1048 DEGREES OF FREEDOM = 1046
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
σr = +2.1244002E+00
Sa = +2.9641118E-03
Se = +2.1168486E+00
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = PERCENT
36.00
32.00
28.00
24.00
20.00
16.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1
WING 6
TP-H 1011
CONSTANT STRAIN

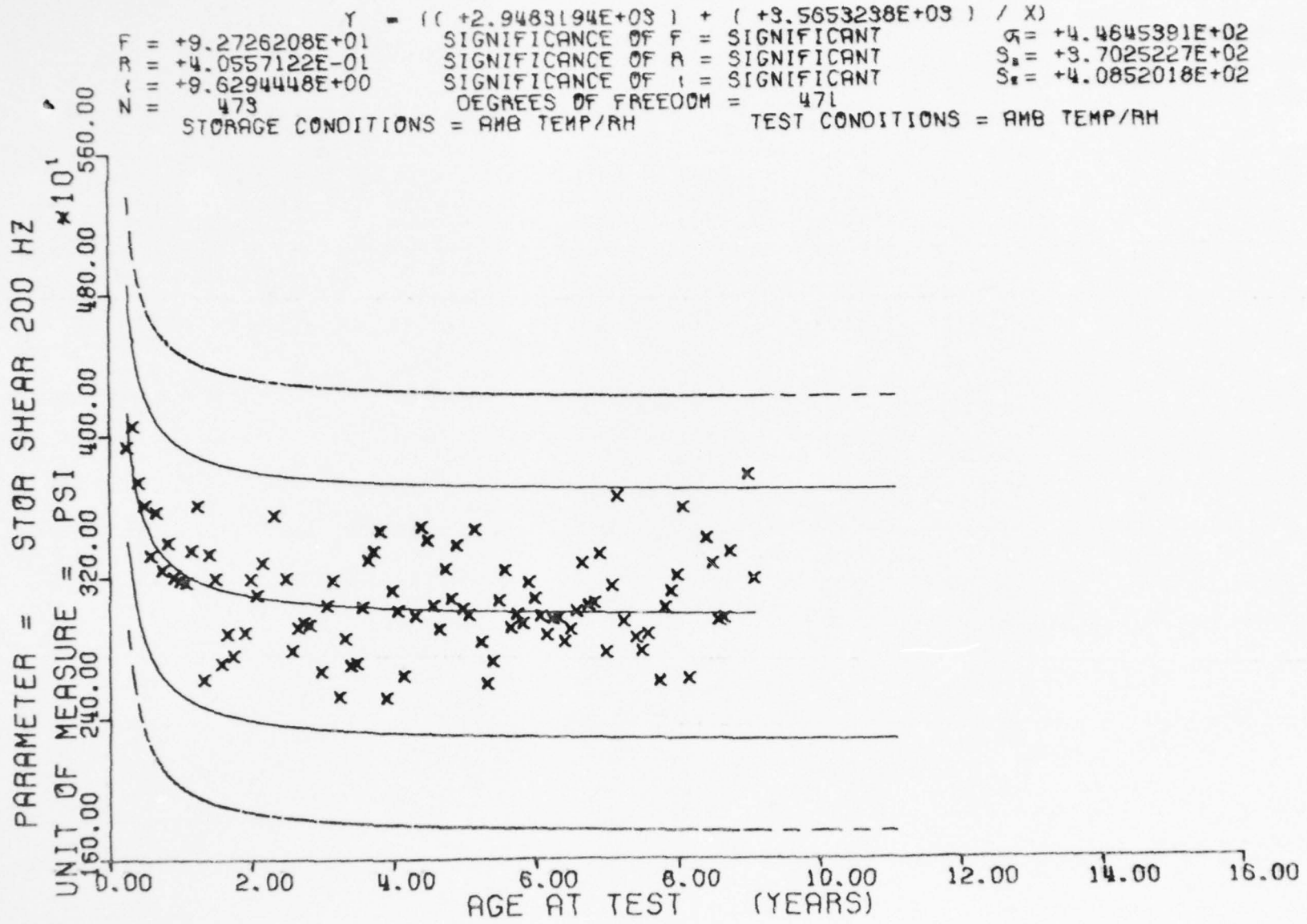
Figure 54

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
3.0	3	31.0	3	58.0	6	83.0	1
4.0	7	32.0	9	59.0	2	84.0	3
5.0	4	33.0	9	60.0	2	85.0	2
6.0	4	34.0	7	61.0	10	86.0	2
7.0	6	36.0	5	62.0	2	87.0	2
8.0	3	37.0	8	63.0	5	89.0	4
9.0	13	38.0	2	64.0	4	90.0	1
10.0	18	39.0	2	65.0	2	91.0	4
11.0	21	40.0	6	66.0	4	93.0	2
12.0	16	41.0	2	67.0	5	94.0	2
13.0	11	42.0	5	68.0	6	95.0	2
14.0	16	43.0	4	69.0	4	96.0	2
15.0	6	44.0	5	70.0	8	97.0	2
16.0	5	45.0	1	71.0	10	98.0	2
17.0	2	46.0	2	72.0	4	101.0	3
18.0	9	47.0	2	73.0	10	102.0	4
19.0	1	48.0	2	74.0	8	103.0	2
20.0	6	49.0	5	75.0	8	104.0	2
21.0	3	50.0	2	76.0	12	105.0	2
23.0	9	52.0	3	77.0	8	108.0	1
24.0	7	53.0	9	78.0	3	109.0	2
25.0	5	54.0	3	79.0	3		
26.0	2	55.0	6	80.0	4		
28.0	2	56.0	2	81.0	6		
30.0	2	57.0	1	82.0	4		

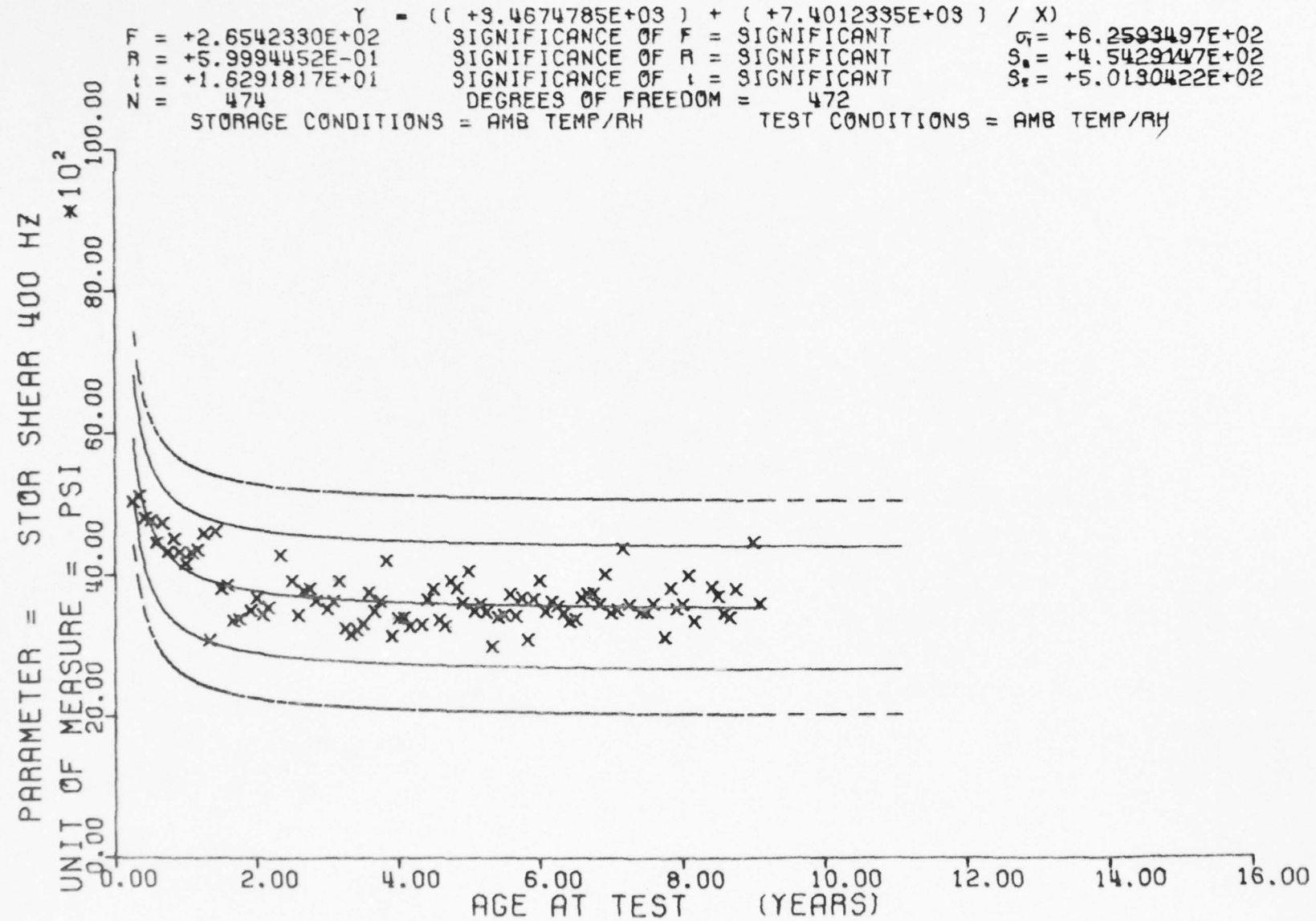
WING 6 S1 TP=H1011 DYNAMIC RESPONSE,CENTER-WT 70 GM.

This sample size summary is applicable for figures 55 thru 58.



WING 6 SL TP-H1011 DYNAMIC RESPONSE, CENTER-WT 70 GM, STOR SHEAR AT 200 HZ

Figure 55



WING 6 S1 TP-H1011 DYNAMIC RESPONSE, CENTER-WT 70 GM, STOR SHEAR AT 400 HZ

Figure 56

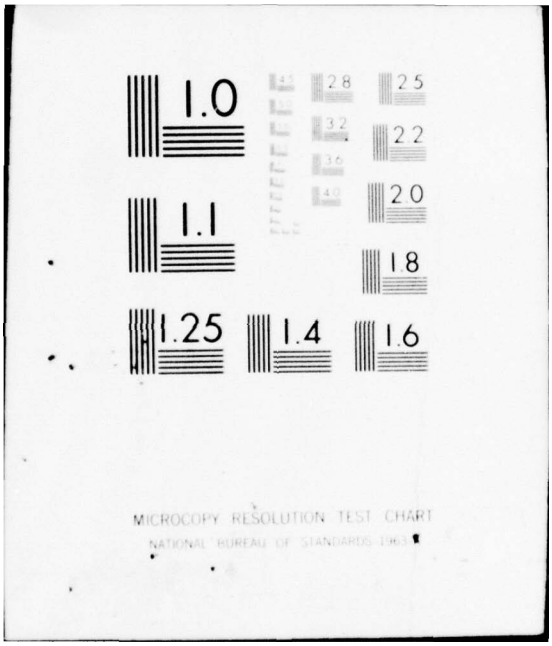
AD-A034 801 OGDEN AIR LOGISTICS CENTER HILL AFB UTAH PROPELLANT L--ETC F/G 21/8.2
PROPELLANT SURVEILLANCE REPORT LGM-30 F AND G STAGE 1, PHASE E,--ETC(U)
OCT 76 J A THOMPSON

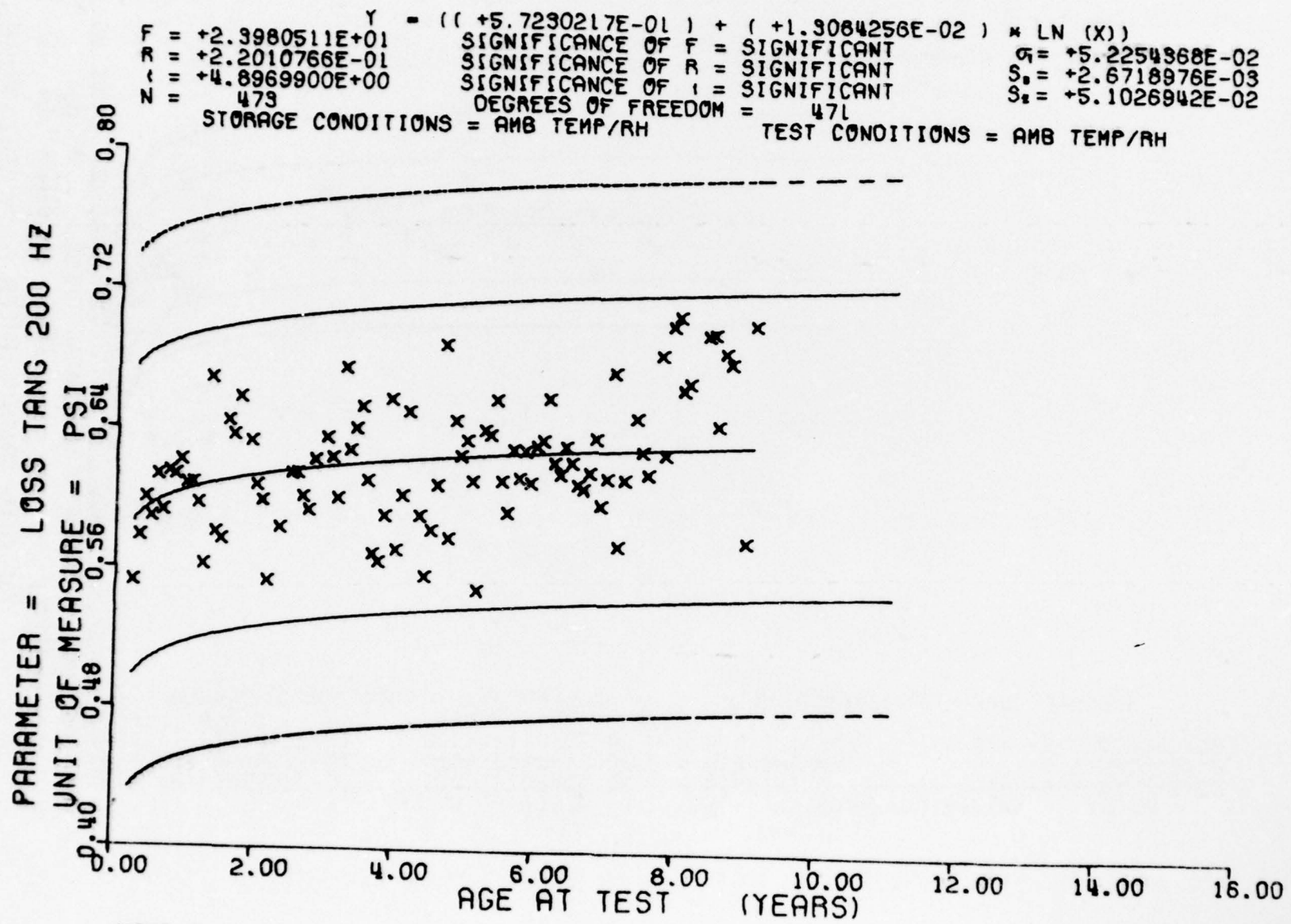
UNCLASSIFIED MANCP-360(76) NL

2 OF 2
AD A034801

END

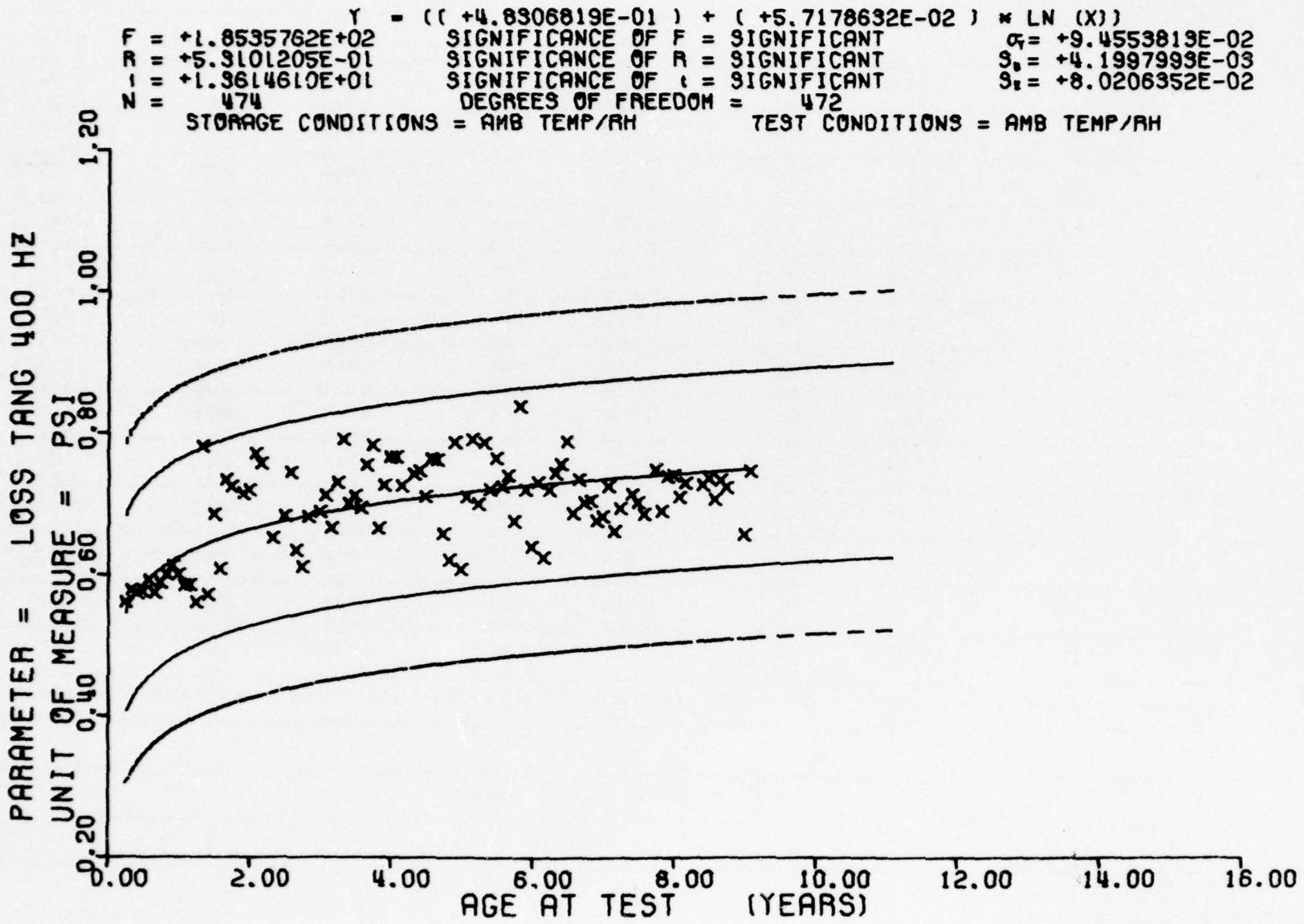
DATE FILMED
2-77


1.0
1.1
1.25
1.4
1.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.8
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963



WING 6 SI TP-H1011 DYNAMIC RESPONSE, CENTER-WT 70 GM, LOSS TANGENT AT 200 HZ

Figure 57



WING 6 SL TP-HL011 DYNAMIC RESPONSE, CENTER-WT 70 GM, LOSS TANGENT AT 400 HZ

Figure 58

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
4.0	66	29.0	36	54.0	48	79.0	31	106.0	5
5.0	108	30.0	66	55.0	49	80.0	45	111.0	3
6.0	123	31.0	56	56.0	30	81.0	58	112.0	21
7.0	114	32.0	58	57.0	41	82.0	50	113.0	45
8.0	114	33.0	50	58.0	39	83.0	5	114.0	12
9.0	117	34.0	41	59.0	61	84.0	35	115.0	3
10.0	108	35.0	43	60.0	70	85.0	8	123.0	12
11.0	125	36.0	61	61.0	51	86.0	46	124.0	12
12.0	75	37.0	20	62.0	60	87.0	30	125.0	27
13.0	93	38.0	48	63.0	59	88.0	38	126.0	18
14.0	104	39.0	28	64.0	58	89.0	30	127.0	24
15.0	109	40.0	23	65.0	56	90.0	37	128.0	15
16.0	108	41.0	30	66.0	45	91.0	16	129.0	12
17.0	121	42.0	33	67.0	30	92.0	18	130.0	6
18.0	93	43.0	31	68.0	66	93.0	23		
19.0	46	44.0	3	69.0	77	94.0	17		
20.0	25	45.0	35	70.0	110	95.0	41		
21.0	39	46.0	63	71.0	37	96.0	5		
22.0	30	47.0	40	72.0	66	97.0	19		
23.0	35	48.0	50	73.0	36	98.0	10		
24.0	42	49.0	28	74.0	91	99.0	10		
25.0	24	50.0	13	75.0	64	100.0	6		
26.0	54	51.0	64	76.0	62	101.0	5		
27.0	36	52.0	55	77.0	72	103.0	16		
28.0	36	53.0	18	78.0	45	104.0	6		

STAGE 1 WING 6 TP=H 1011 SHORE A, 10 SECOND HARDNESS

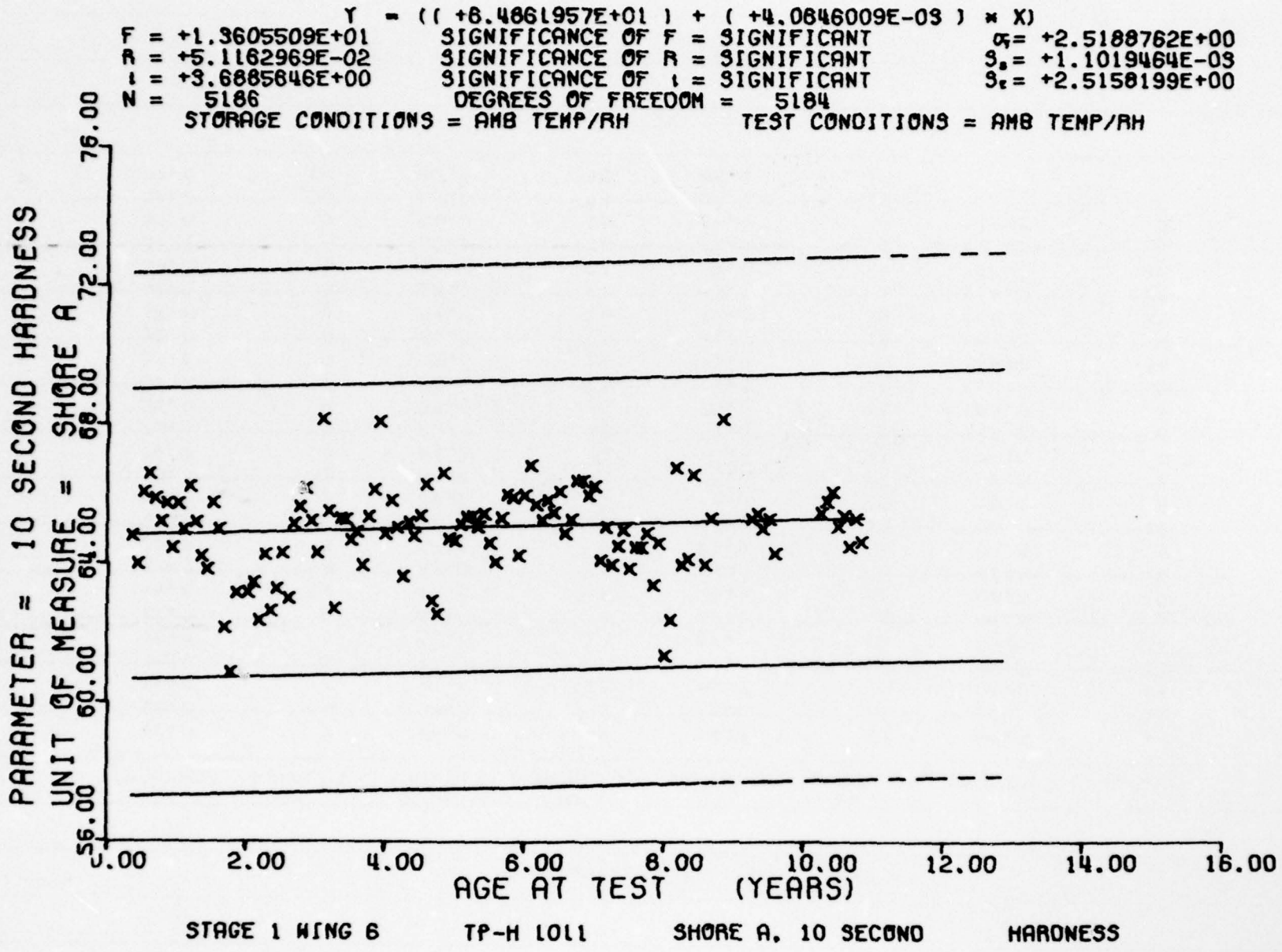

Y = ((+6.4861957E+01) + (+4.0846009E-03) * X)
F = +1.3605509E+01 SIGNIFICANCE OF F = SIGNIFICANT σr= +2.5188762E+00
R = +5.1162969E-02 SIGNIFICANCE OF R = SIGNIFICANT Sb= +1.1019464E-03
t = +3.6885846E+00 SIGNIFICANCE OF t = SIGNIFICANT Sε= +2.5158199E+00
N = 5186 DEGREES OF FREEDOM = 5184
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = 10 SECOND HARDNESS
UNIT OF MEASURE = SHORE A
76.00
72.00
68.00
64.00
60.00
56.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1 WING 6 TP-H 1011 SHORE A, 10 SECOND HARDNESS

Figure 59

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
10.0	3	38.0	9	64.0	23	89.0	13
12.0	6	39.0	5	65.0	18	90.0	28
14.0	6	40.0	12	66.0	6	91.0	14
15.0	3	41.0	6	67.0	15	92.0	11
16.0	6	42.0	12	68.0	12	93.0	9
17.0	6	43.0	9	69.0	6	94.0	8
18.0	12	44.0	6	70.0	21	95.0	9
19.0	3	45.0	6	71.0	9	96.0	9
20.0	3	46.0	9	72.0	6	97.0	9
21.0	6	47.0	15	73.0	12	98.0	17
22.0	3	49.0	12	74.0	26	99.0	6
23.0	3	50.0	15	75.0	35	100.0	6
24.0	3	51.0	3	76.0	33	102.0	3
25.0	6	52.0	12	77.0	27	103.0	6
26.0	9	53.0	6	78.0	11	104.0	4
27.0	6	54.0	21	79.0	31	105.0	3
28.0	9	55.0	15	80.0	9	106.0	14
30.0	3	56.0	3	81.0	12	111.0	3
31.0	6	57.0	18	82.0	6	114.0	33
32.0	6	58.0	24	83.0	6	115.0	20
33.0	3	59.0	21	84.0	8	116.0	16
34.0	9	60.0	36	85.0	6	117.0	6
35.0	3	61.0	15	86.0	6	118.0	2
36.0	9	62.0	40	87.0	12		
37.0	16	63.0	33	88.0	12		

STAGE 1 WING 6 TP-H1011 BURNING RATE AT 1000 PSI

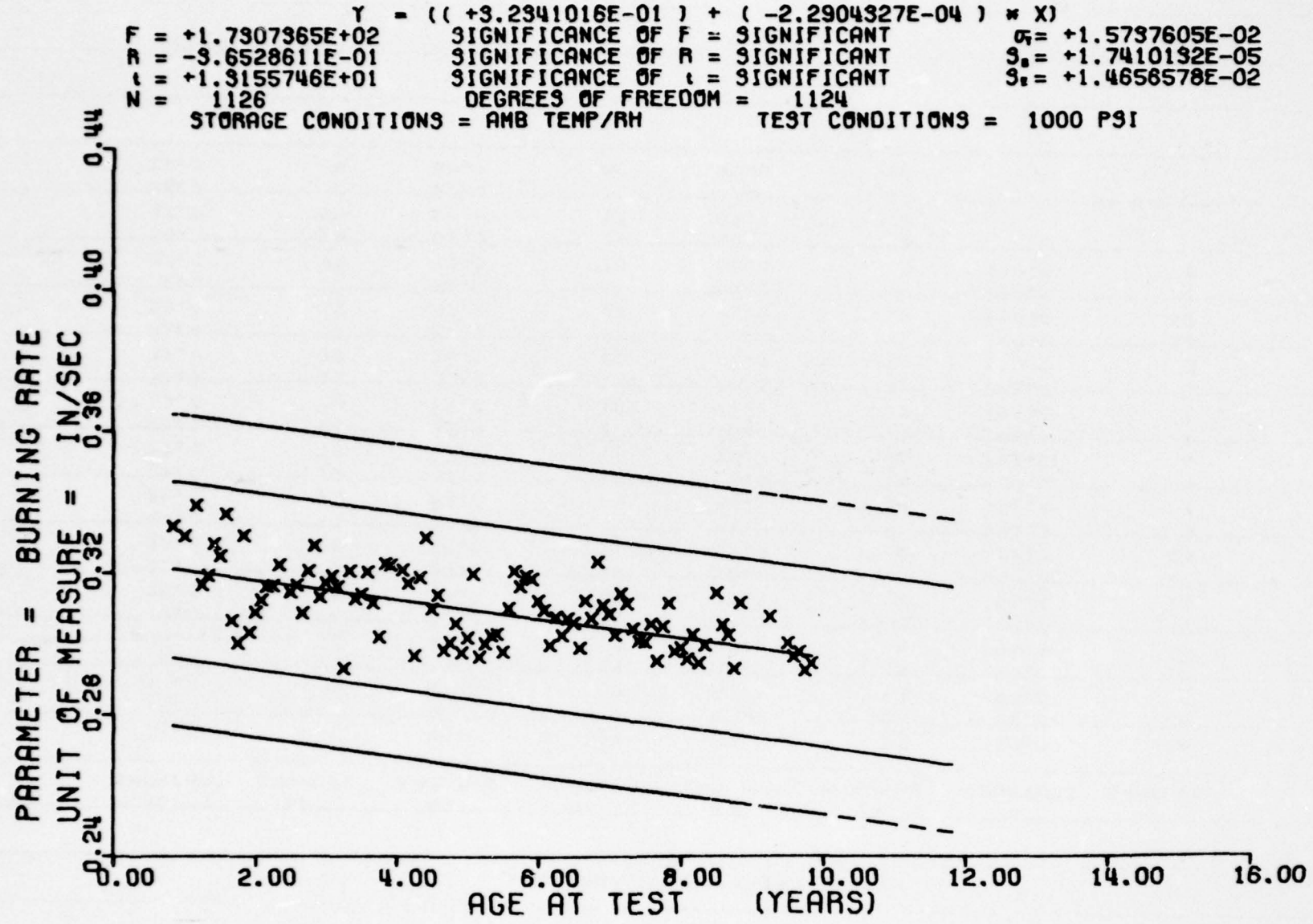

Y = ((+3.2341016E-01) + (-2.2904327E-04) * X)
F = +1.7307365E+02 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.5737605E-02
R = -3.6528611E-01 SIGNIFICANCE OF R = SIGNIFICANT S_a = +1.7410132E-05
t = +1.3155746E+01 SIGNIFICANCE OF t = SIGNIFICANT S_e = +1.4656578E-02
N = 1126 DEGREES OF FREEDOM = 1124
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 1000 PSI
PARAMETER = BURNING RATE
UNIT OF MEASURE = IN/SEC
0.44
0.40
0.36
0.32
0.28
0.24
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE I WING 6 TP-H1011 BURNING RATE AT 1000 PSI

Figure 60

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
11.0	1	40.0	11	65.0	27	90.0	36
14.0	1	41.0	4	66.0	18	91.0	24
15.0	1	42.0	9	67.0	8	92.0	9
16.0	5	43.0	4	68.0	5	93.0	17
18.0	1	44.0	7	69.0	4	94.0	15
19.0	4	45.0	4	70.0	7	95.0	19
20.0	5	46.0	3	71.0	2	96.0	12
21.0	4	47.0	7	72.0	5	97.0	17
22.0	4	48.0	1	73.0	2	98.0	15
24.0	10	49.0	9	74.0	1	100.0	3
25.0	13	50.0	4	75.0	30	101.0	9
26.0	12	51.0	14	76.0	26	102.0	6
27.0	18	52.0	9	77.0	22	103.0	6
28.0	18	53.0	20	78.0	13	105.0	9
29.0	25	54.0	10	79.0	7	106.0	6
30.0	12	55.0	16	80.0	21	108.0	3
31.0	30	56.0	12	81.0	24	113.0	3
32.0	30	57.0	19	82.0	7	115.0	36
33.0	39	58.0	16	83.0	9	116.0	42
34.0	15	59.0	24	84.0	9	117.0	3
35.0	38	60.0	13	85.0	3	118.0	3
36.0	18	61.0	10	86.0	3		
37.0	10	62.0	17	87.0	3		
38.0	2	63.0	20	88.0	12		
39.0	4	64.0	40	89.0	24		

STAGE I WING 6 TP=H 1011

PRESSURE TIME

This sample size summary is applicable to figures 61 and 62.

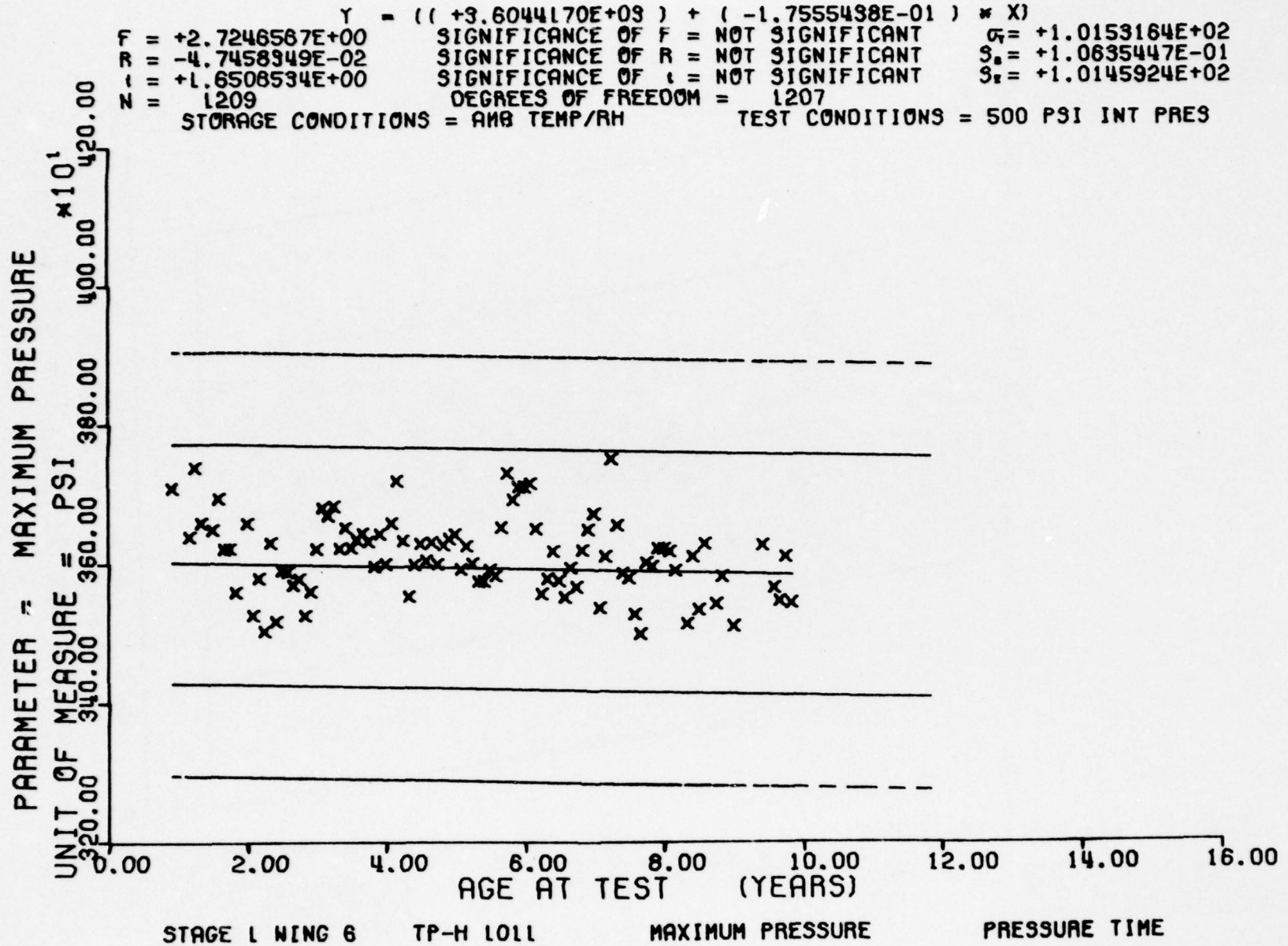

Y = ((+3.6044170E+03) + (-1.7555438E-01) * X)
F = +2.7246567E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +1.0153164E+02
R = -4.7458949E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S = +1.0635447E-01
t = +1.6508534E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S = +1.0145924E+02
N = 1209 DEGREES OF FREEDOM = 1207
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 500 PSI INT PRES
PARAMETER = MAXIMUM PRESSURE
UNIT OF MEASURE = PSI *10¹
320.00
340.00
360.00
380.00
400.00
420.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1 WING 6 TP-H 1011 MAXIMUM PRESSURE PRESSURE TIME

Figure 61

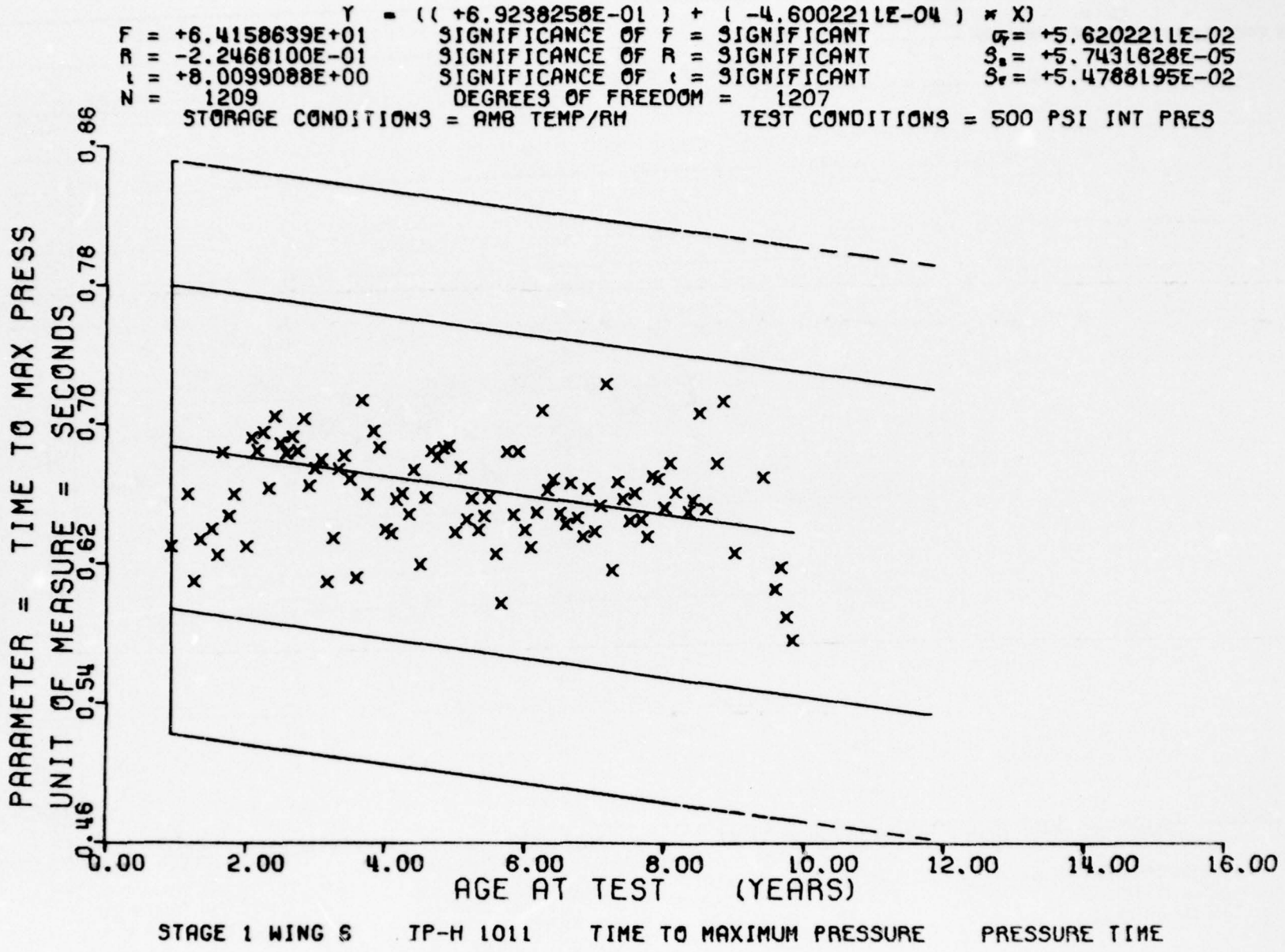
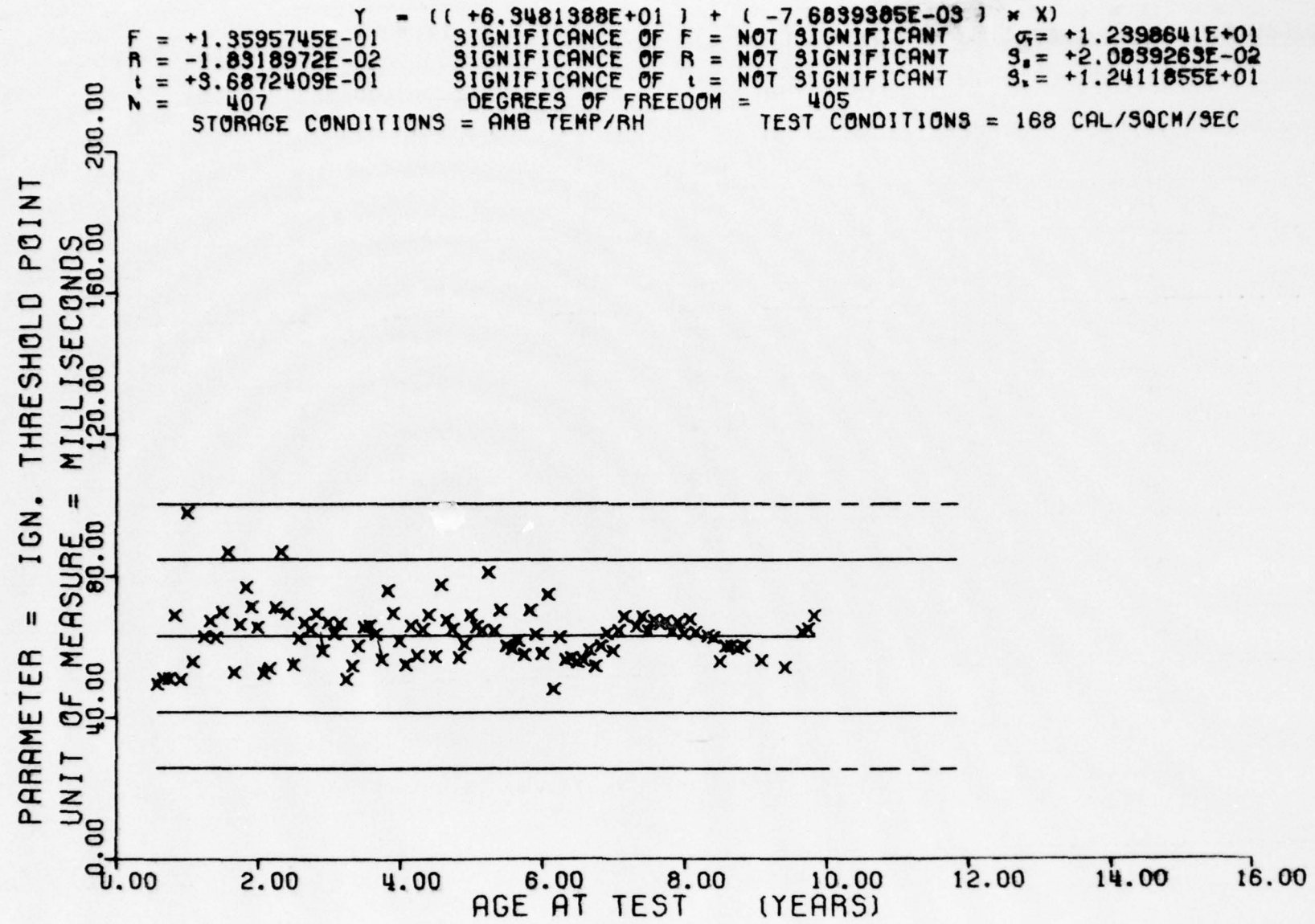

Y = ((+6.9238258E-01) + (-4.6002211E-04) * X)
F = +6.4158639E+01 SIGNIFICANCE OF F = SIGNIFICANT σr= +5.6202211E-02
R = -2.2466100E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa= +5.7431628E-05
t = +8.0099088E+00 SIGNIFICANCE OF t = SIGNIFICANT Sr= +5.4788195E-02
N = 1209 DEGREES OF FREEDOM = 1207
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 500 PSI INT PRES
PARAMETER = TIME TO MAX PRESS
UNIT OF MEASURE = SECONDS
0.86
0.78
0.70
0.62
0.54
0.46
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1 WING S TP-H 1011 TIME TO MAXIMUM PRESSURE PRESSURE TIME

Figure 62

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NP SAMPLES	AGE (MONTHS)	NP SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
7.0	7	32.0	1	57.0	2	82.0	4
8.0	6	33.0	4	58.0	3	83.0	6
9.0	3	34.0	4	59.0	6	84.0	4
10.0	5	35.0	1	60.0	6	85.0	2
11.0	1	36.0	7	61.0	3	86.0	2
12.0	1	37.0	5	62.0	5	88.0	3
13.0	2	38.0	3	63.0	1	89.0	4
14.0	1	39.0	2	64.0	8	90.0	7
15.0	3	40.0	3	65.0	5	91.0	8
16.0	2	41.0	3	66.0	6	92.0	3
17.0	3	42.0	3	67.0	9	93.0	14
18.0	2	43.0	4	68.0	3	94.0	6
19.0	2	44.0	3	69.0	5	95.0	5
20.0	2	45.0	2	70.0	6	96.0	2
21.0	2	46.0	1	71.0	4	97.0	6
22.0	1	47.0	5	72.0	3	98.0	2
23.0	6	48.0	5	73.0	4	100.0	1
24.0	3	49.0	2	74.0	1	101.0	2
25.0	3	50.0	4	75.0	3	102.0	3
26.0	1	51.0	2	76.0	10	103.0	1
27.0	3	52.0	4	77.0	10	104.0	2
28.0	1	53.0	3	78.0	12	105.0	3
29.0	2	54.0	4	79.0	4	106.0	1
30.0	1	55.0	2	80.0	10	109.0	1
31.0	4	56.0	2	81.0	12	113.0	1
						116.0	19
						117.0	8
						118.0	2

STAGE 1 WING 6, TP-H 1011, IGNITABILITY, IGN THRESHOLD POINT, 168 CAL/SQ CM/SEC



STAGE 1 WING 6, TP-H 1011, IGNITABILITY, IGN THRESHOLD POINT, 168 CAL/SQ CM/SEC

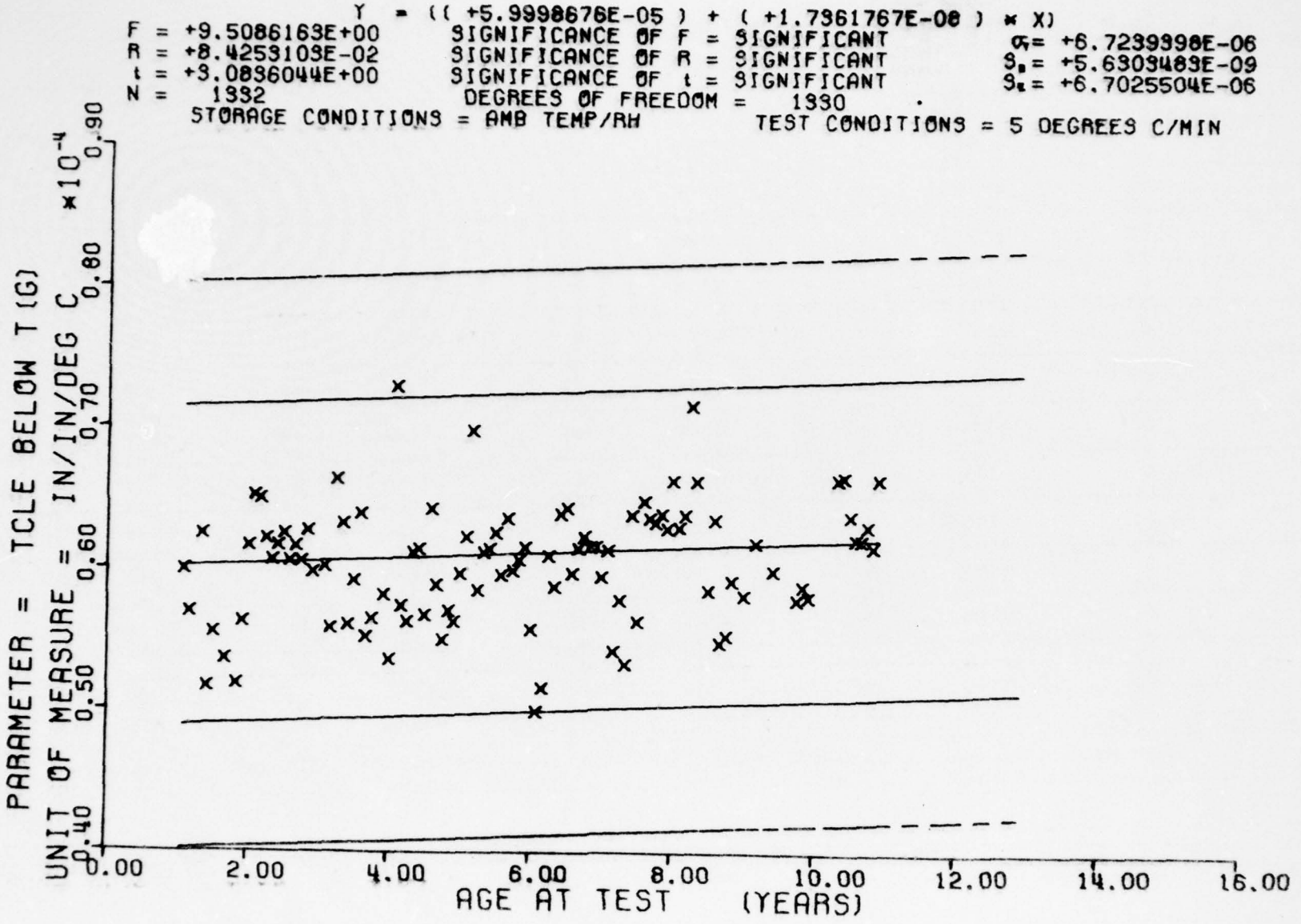
Figure 63

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
13.0	3	42.0	12	68.0	18	93.0	21
14.0	3	43.0	12	69.0	24	94.0	21
16.0	6	44.0	6	70.0	12	95.0	21
17.0	3	45.0	9	71.0	18	96.0	6
18.0	9	47.0	15	72.0	6	97.0	9
20.0	6	48.0	3	73.0	3	98.0	21
22.0	9	49.0	6	74.0	3	99.0	6
23.0	6	50.0	6	75.0	9	100.0	9
24.0	12	51.0	3	76.0	19	102.0	9
25.0	18	52.0	18	77.0	18	103.0	3
26.0	9	53.0	27	78.0	18	104.0	3
27.0	24	54.0	9	79.0	9	105.0	9
28.0	21	55.0	18	80.0	15	106.0	9
29.0	24	56.0	18	81.0	30	108.0	6
30.0	27	57.0	12	82.0	3	110.0	3
31.0	33	58.0	27	83.0	15	113.0	6
32.0	30	59.0	9	84.0	9	117.0	36
33.0	24	60.0	15	85.0	9	118.0	36
34.0	33	61.0	9	86.0	9	119.0	6
35.0	12	62.0	15	87.0	6	124.0	21
37.0	23	63.0	12	88.0	3	125.0	27
38.0	3	64.0	15	89.0	12	126.0	9
39.0	3	65.0	21	90.0	9	127.0	27
40.0	12	66.0	12	91.0	9	128.0	18
41.0	6	67.0	12	92.0	3	129.0	6
						130.0	9
						131.0	6

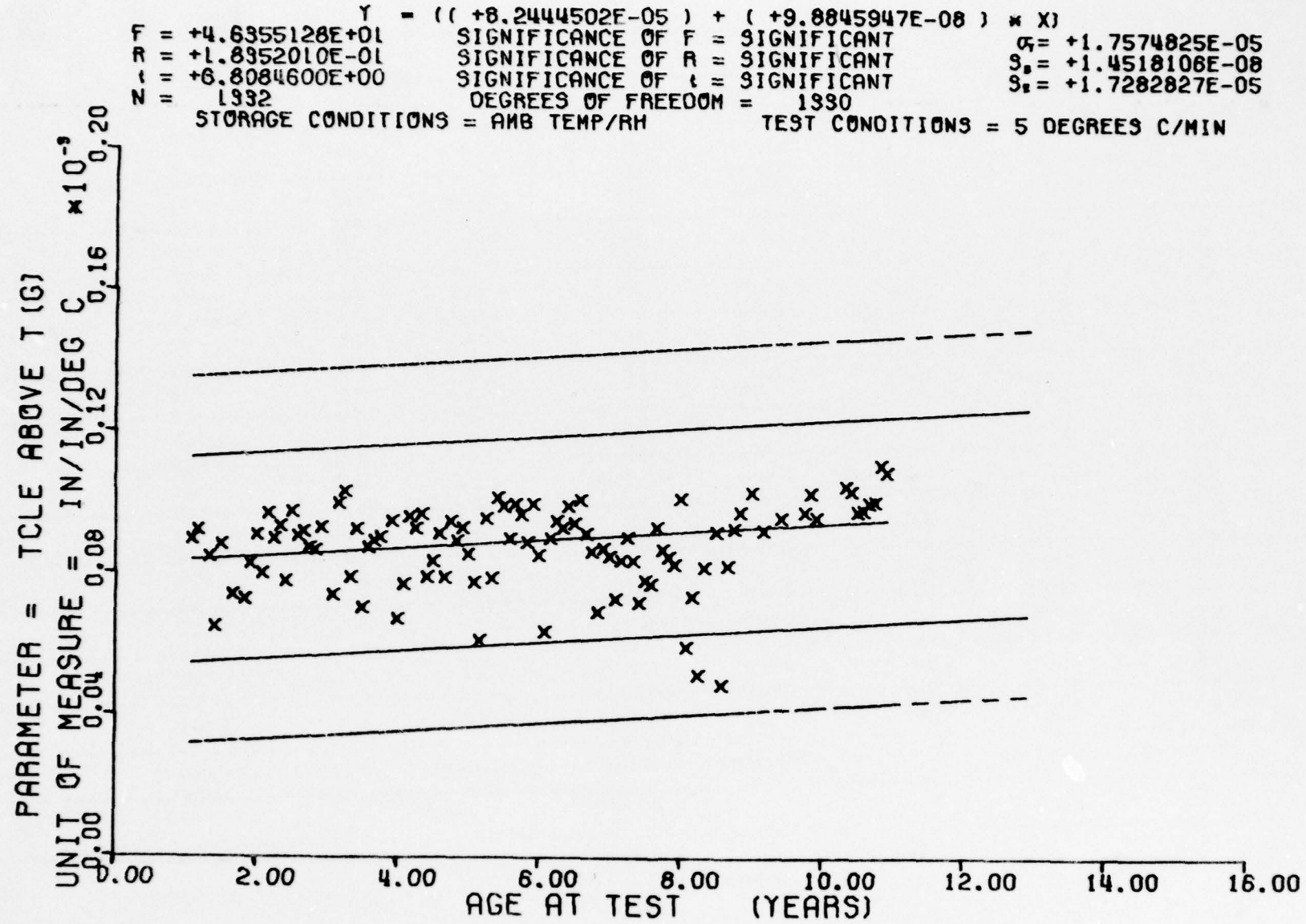
STAGE 1, WING 6, TP-H1011 - THERMAL COEFFICIENT OF LINEAR EXPANSION

This sample size summary is applicalbe to figures 64 and 65.



STAGE 1, WING 6, TP-H1011 THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

Figure 64



STAGE 1, WING 6, TP-H1011, THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Figure 55

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
10.0	4	37.0	12	62.0	40	87.0	8
12.0	4	38.0	12	63.0	36	88.0	20
13.0	4	39.0	12	64.0	48	89.0	28
14.0	8	40.0	20	65.0	44	90.0	24
15.0	4	41.0	8	66.0	16	91.0	40
16.0	4	42.0	4	67.0	16	92.0	16
17.0	4	43.0	16	68.0	8	93.0	12
18.0	20	44.0	4	69.0	8	94.0	16
19.0	12	45.0	8	70.0	12	95.0	20
20.0	0	46.0	12	71.0	28	96.0	12
22.0	8	47.0	16	72.0	12	97.0	12
23.0	12	48.0	24	73.0	8	98.0	16
24.0	4	49.0	16	74.0	36	99.0	8
25.0	28	50.0	8	75.0	28	102.0	4
26.0	24	51.0	8	76.0	40	103.0	8
27.0	24	52.0	24	77.0	32	106.0	8
28.0	28	53.0	36	78.0	32	107.0	8
29.0	24	54.0	4	79.0	32	114.0	48
30.0	28	55.0	24	80.0	32	115.0	48
31.0	44	56.0	36	81.0	12	116.0	12
32.0	52	57.0	12	82.0	8	117.0	4
33.0	36	58.0	40	83.0	12		
34.0	28	59.0	20	84.0	8		
35.0	52	60.0	28	85.0	9		
36.0	24	61.0	32	86.0	4		

STAGE 1. WING 6. TP-H1C11. SOL GEL.

This sample size summary is applicable to figures 66 thru 69.

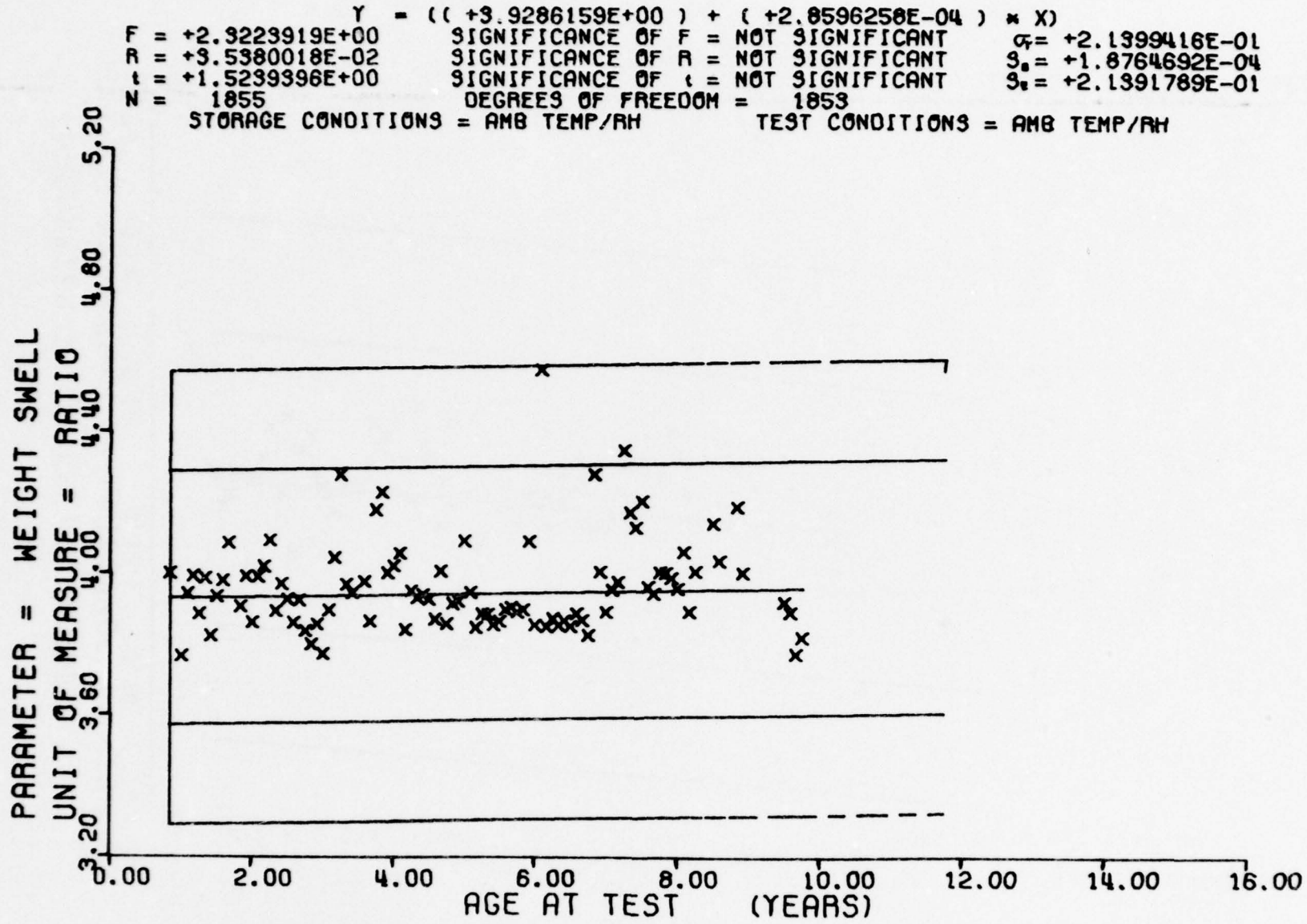
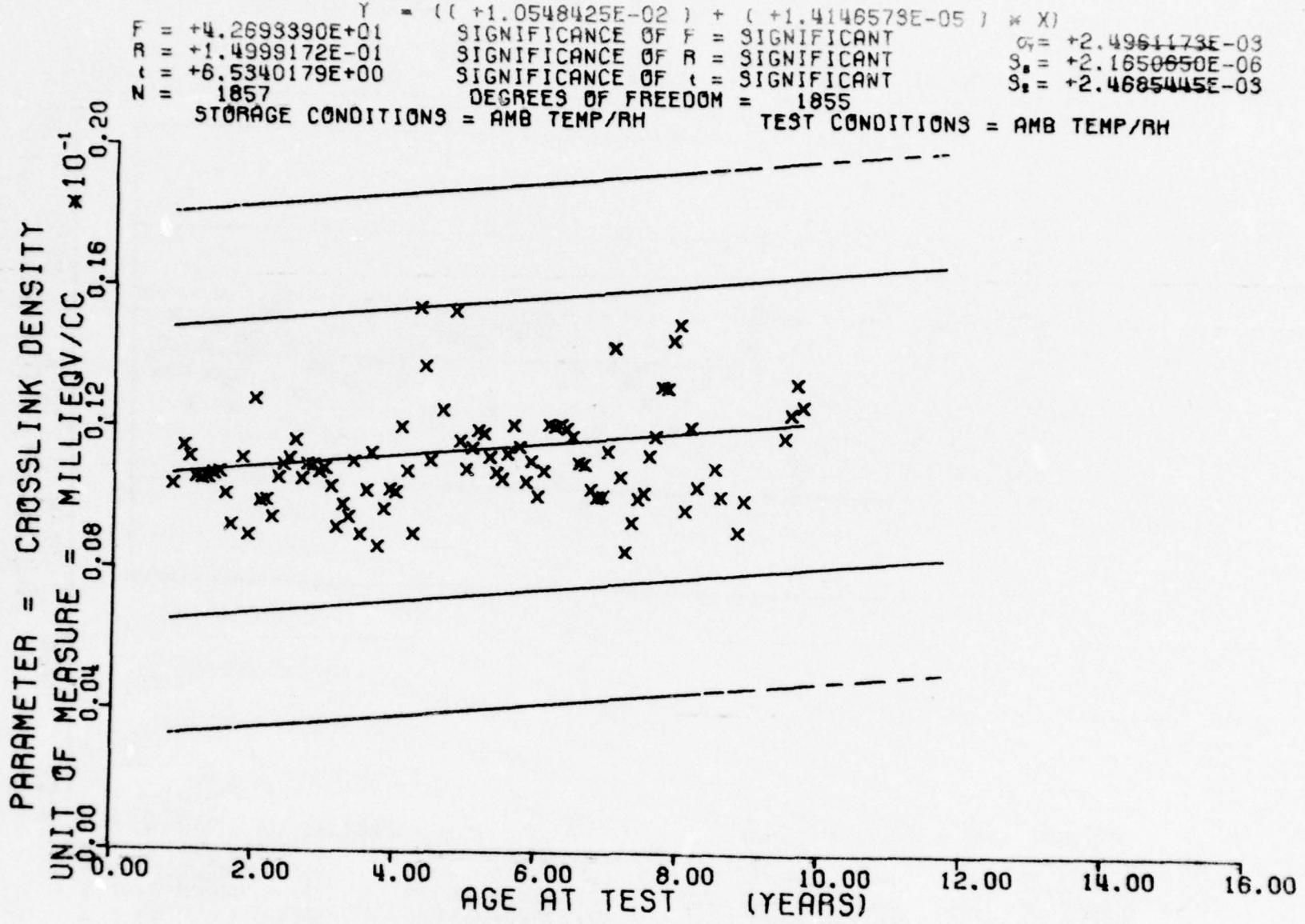
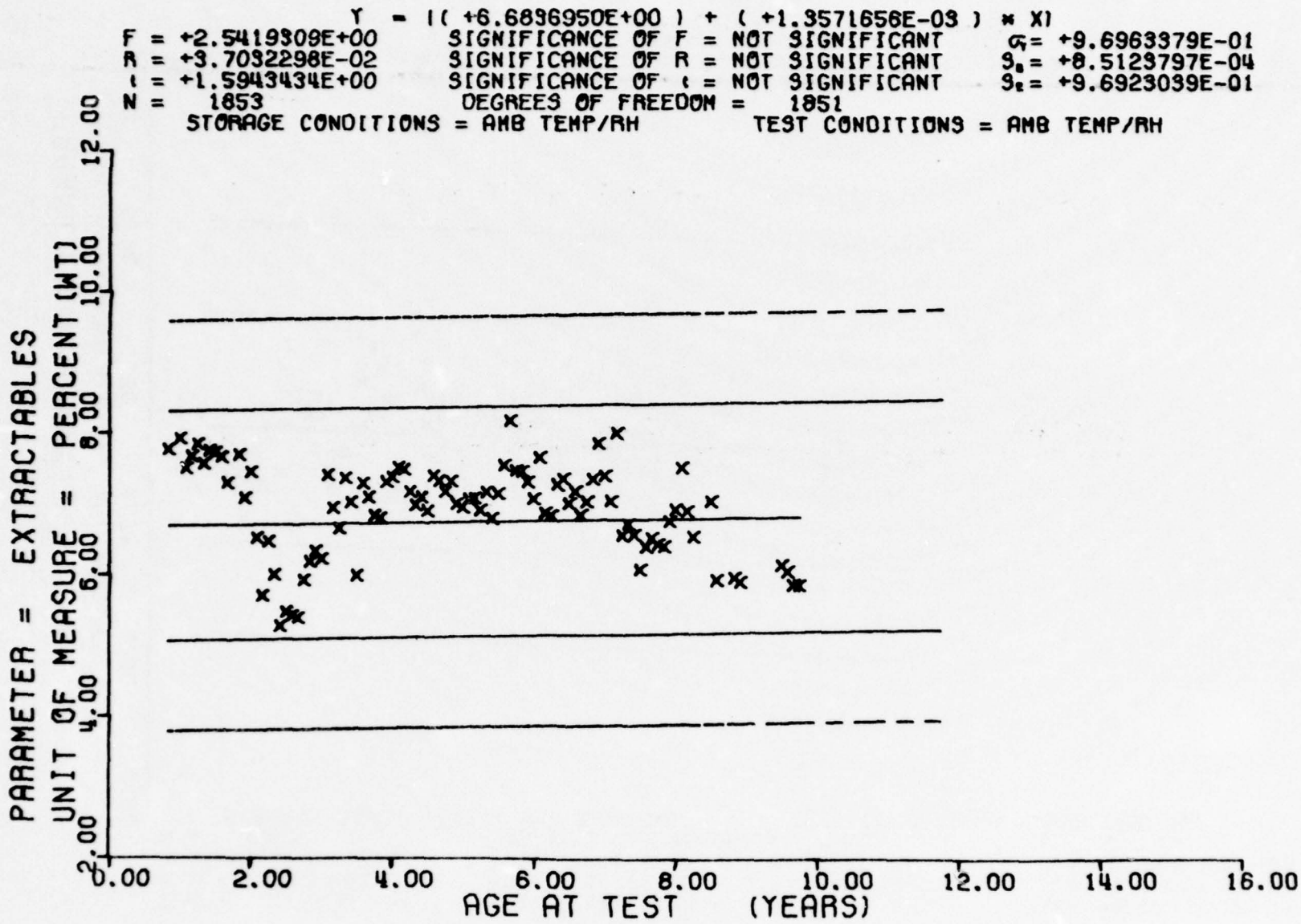

Y = ((+3.9286159E+00) + (+2.8596258E-04) * X)
F = +2.3223919E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +2.1399416E-01
R = +3.5380018E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sa = +1.8764692E-04
t = +1.5239396E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Se = +2.1391789E-01
N = 1855 DEGREES OF FREEDOM = 1853
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = WEIGHT SWELL
UNIT OF MEASURE = RATIO
5.20
4.80
4.40
4.00
3.60
3.20
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1, WING 6, TP-H1011, SOL GEL, GEL SWELL RATIO

Figure 66



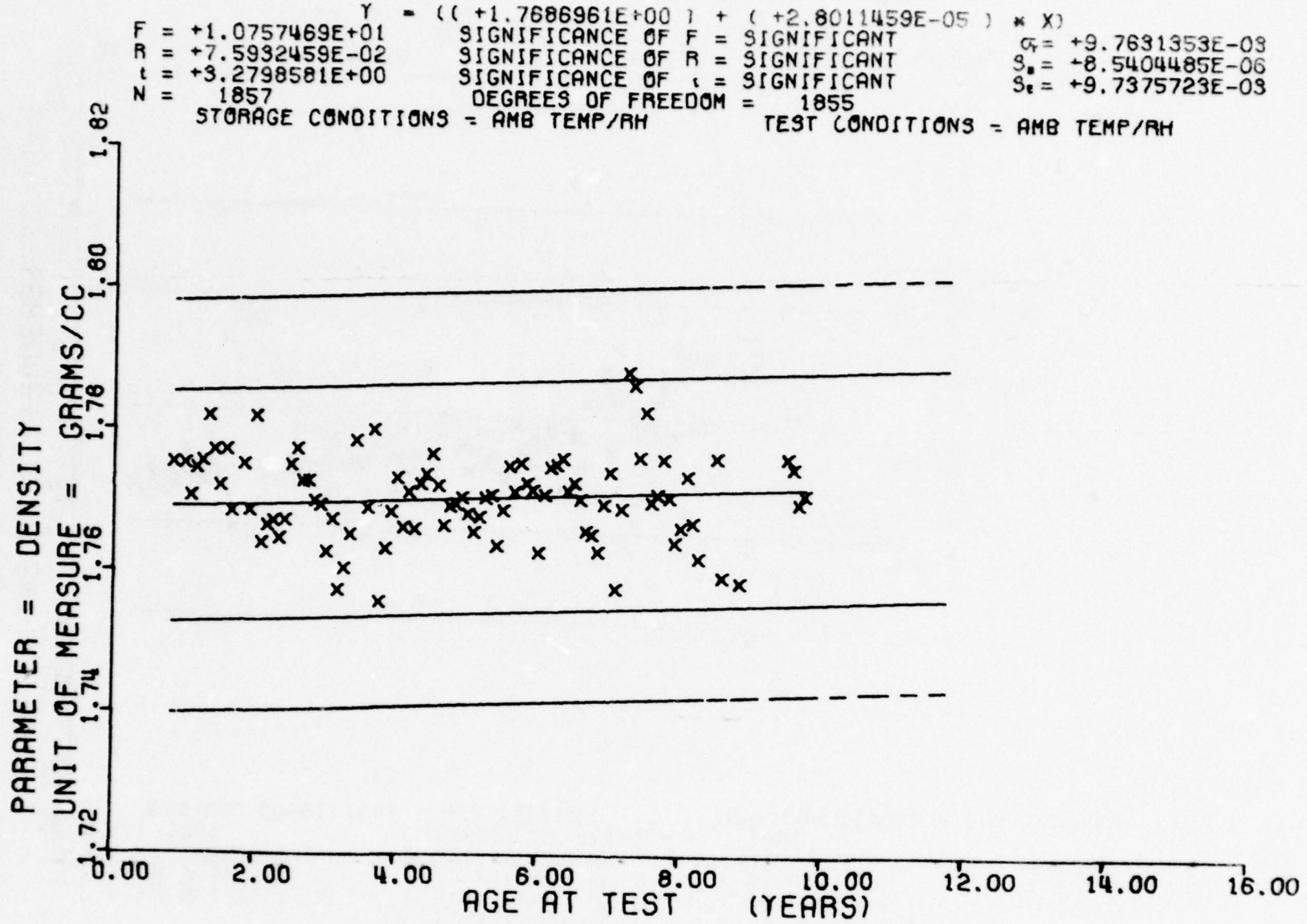
STAGE 1, WING 6, TP-H1011, SOL GEL, CROSSLINK DENSITY

Figure 67



STAGE 1, WING 6 TP-H1011, SOL GEL, PERCENT EXTRACTABLES

Figure 68



STAGE 1, WING 6, TP-H1011, SOL GEL, DENSITY

Figure 69

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
1.0	3	61.0	1	110.0	2
11.0	1	62.0	1		
13.0	1	63.0	2		
15.0	1	64.0	3		
16.0	1	65.0	2		
18.0	1	66.0	1		
20.0	2	67.0	4		
29.0	1	69.0	4		
35.0	1	70.0	1		
36.0	4	71.0	2		
37.0	4	72.0	1		
39.0	3	73.0	4		
40.0	3	75.0	2		
41.0	3	76.0	1		
42.0	3	79.0	6		
45.0	3	87.0	1		
47.0	1	91.0	1		
48.0	2	95.0	3		
49.0	1	97.0	6		
50.0	3	99.0	3		
51.0	3	102.0	3		
53.0	3	103.0	6		
56.0	1	104.0	3		
57.0	3	105.0	2		
59.0	1	106.0	2		

STAGE I WING 6 TGA IGNITION TEMPERATURE, 9 DEGREE C RISE/MINUTE

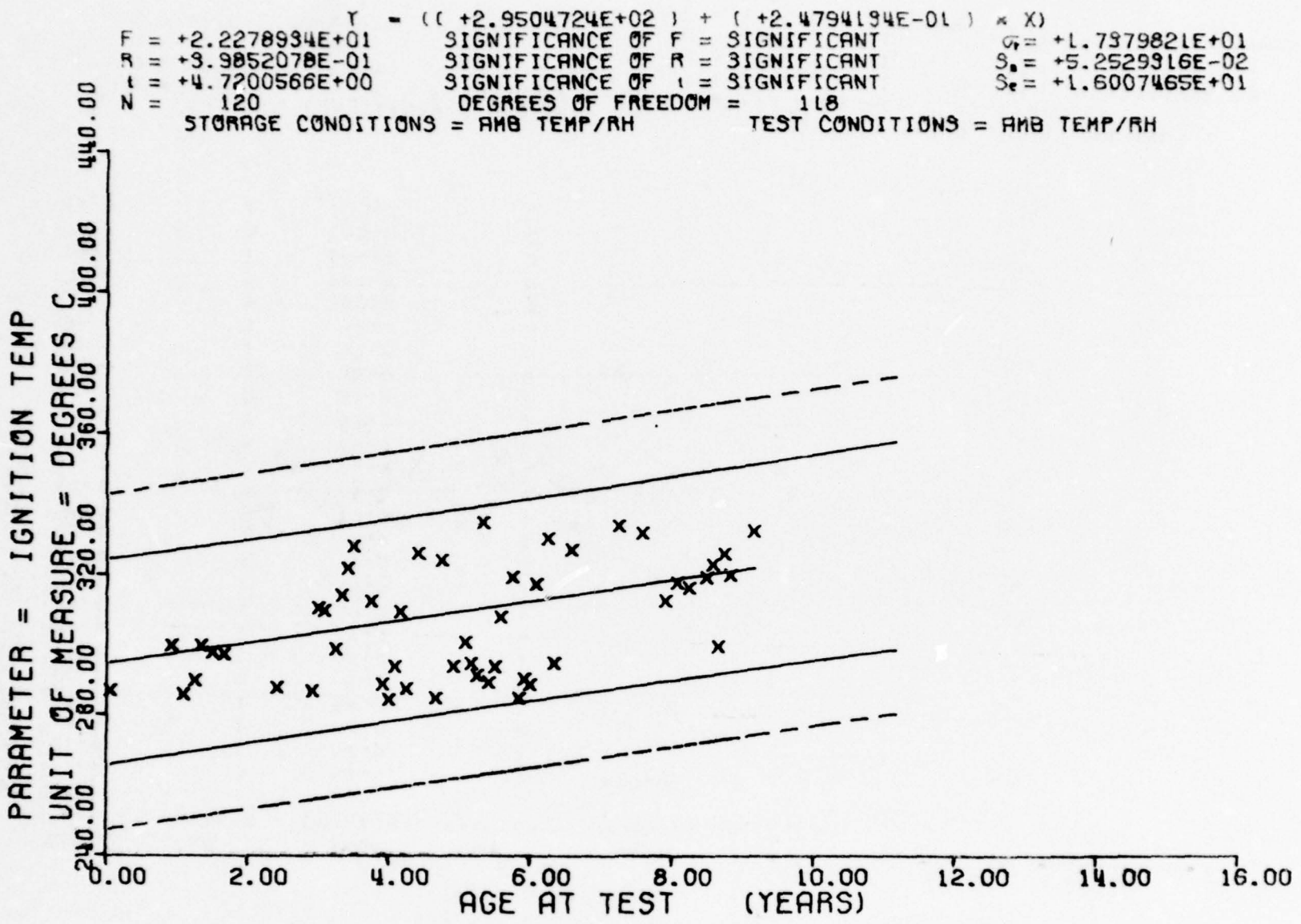

Y = ((+2.9504724E+02) + (+2.4794194E-01) * X)
F = +2.2278934E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.7379821E+01
R = +3.9852078E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +5.2529916E-02
t = +4.7200566E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +1.6007465E+01
N = 120 DEGREES OF FREEDOM = 118
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = IGNITION TEMP
UNIT OF MEASURE = DEGREES C
240.00
280.00
320.00
360.00
400.00
440.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE I WING 6
TGA IGNITION TEMPERATURE, 9 DEGREE C RISE/MINUTE

Figure 70

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
1.0	3	61.0	1	110.0	2
11.0	1	62.0	1		
13.0	1	63.0	2		
15.0	1	64.0	3		
16.0	1	65.0	2		
18.0	1	66.0	1		
20.0	2	67.0	4		
23.0	1	69.0	4		
35.0	1	70.0	1		
36.0	4	71.0	2		
37.0	4	72.0	1		
39.0	1	73.0	4		
40.0	2	75.0	2		
41.0	3	76.0	1		
42.0	3	79.0	6		
45.0	2	87.0	1		
47.0	1	91.0	1		
48.0	2	95.0	3		
49.0	1	97.0	5		
50.0	2	99.0	2		
51.0	3	102.0	3		
53.0	3	103.0	5		
56.0	1	104.0	1		
57.0	3	105.0	2		
59.0	1	106.0	2		

STAGE I WING 6 TGA PERCENT WEIGHT LOSS AT IGNITION, 9 DEG C RISE/MIN

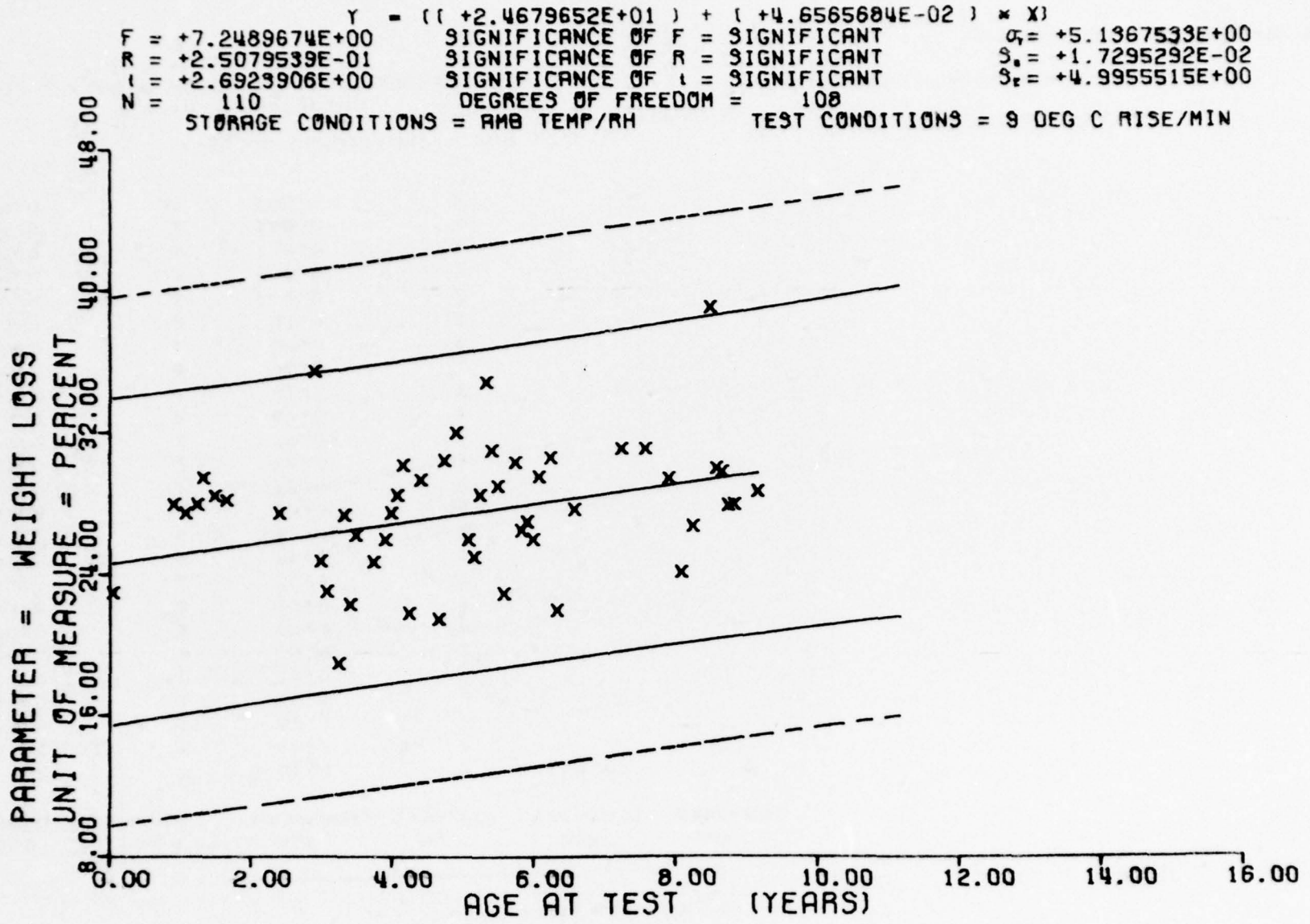

Y = ((+2.4679652E+01) + (+4.6565604E-02) * X)
F = +7.2489674E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +5.1367533E+00
R = +2.5079539E-01 SIGNIFICANCE OF R = SIGNIFICANT S_e = +1.7295292E-02
t = +2.6923906E+00 SIGNIFICANCE OF t = SIGNIFICANT S_r = +4.9955515E+00
N = 110 DEGREES OF FREEDOM = 108
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 9 DEG C RISE/MIN
PARAMETER = WEIGHT LOSS
UNIT OF MEASURE = PERCENT
48.00
40.00
32.00
24.00
16.00
8.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE I WING 6
TGA PERCENT WEIGHT LOSS AT IGNITION, 9 DEG C RISE/MIN

Figure 71

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
36.0	1	106.0	1
37.0	1	110.0	1
39.0	1		
40.0	1		
41.0	1		
42.0	1		
45.0	1		
50.0	1		
53.0	1		
57.0	1		
64.0	1		
67.0	1		
69.0	1		
73.0	1		
75.0	1		
79.0	2		
87.0	1		
91.0	1		
95.0	1		
97.0	2		
99.0	1		
102.0	1		
103.0	2		
104.0	1		
105.0	1		

SAGE I WING 6 TGA % WT LOSS AT 250 DEG C HOLD, 12 DEG RISE/MIN TO HOLD

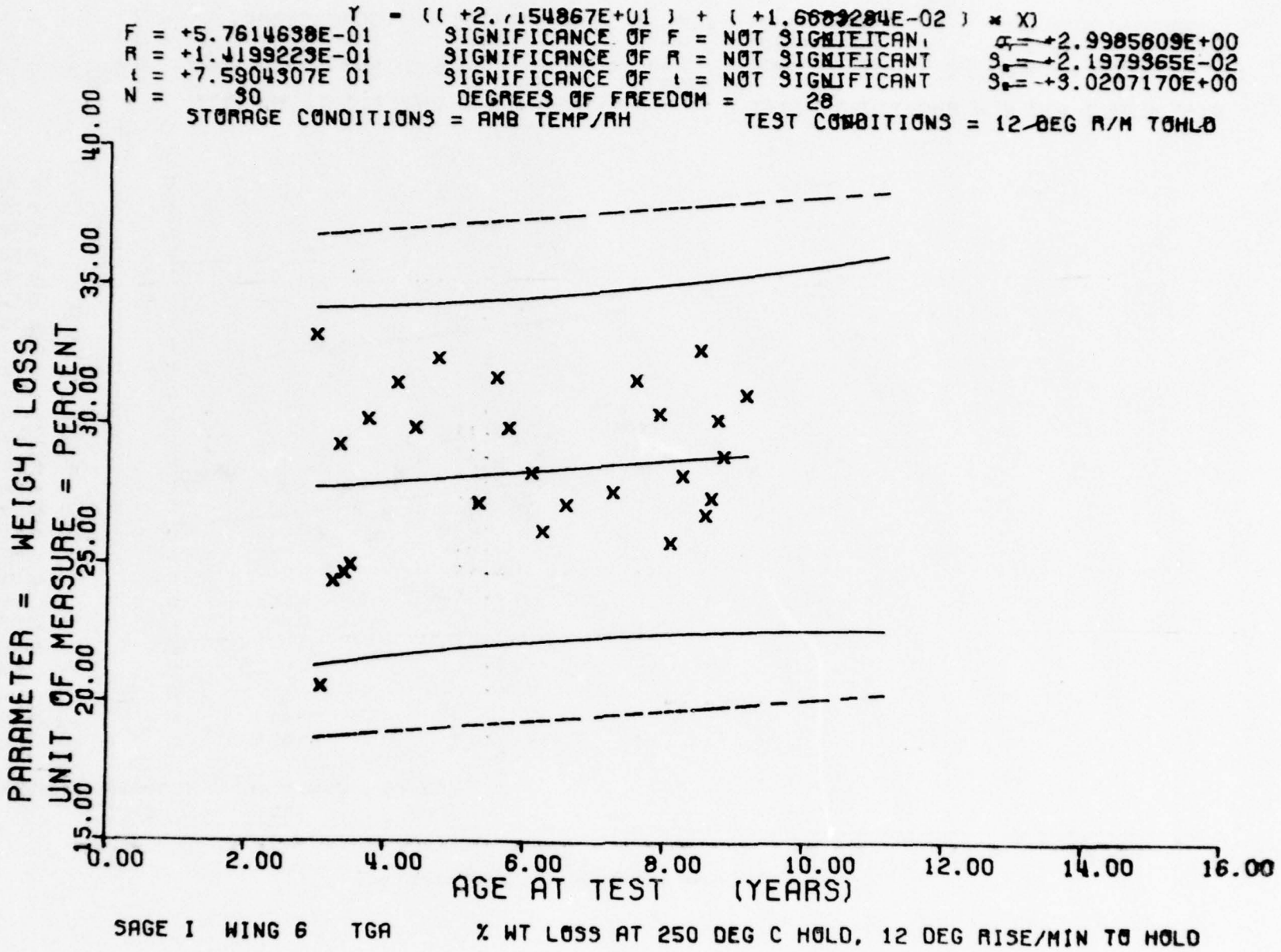

Y = ((+2.7154867E+01) + (+1.6683284E-02) * X)
F = +5.7614638E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT
R = +1.4199223E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT
t = +7.5904307E 01 SIGNIFICANCE OF t = NOT SIGNIFICANT
N = 30 DEGREES OF FREEDOM = 28
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 12 DEG R/M TO HLD
PARAMETER = WEIGHT LOSS
UNIT OF MEASURE = PERCENT
15.00
20.00
25.00
30.00
35.00
40.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
SAGE I WING 6 TGA % WT LOSS AT 250 DEG C HOLD, 12 DEG RISE/MIN TO HOLD

Figure 72

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
5.0	9	36.0	17	61.0	8	86.0	12	[illegible]	42
6.0	27	37.0	8	62.0	8	87.0	15	[illegible]	15
7.0	11	38.0	6	63.0	12	88.0	12	[illegible]	3
8.0	9	39.0	5	64.0	5	89.0	23	[illegible]	13
12.0	3	40.0	15	65.0	10	90.0	27	[illegible]	38
13.0	3	41.0	2	66.0	9	91.0	9	[illegible]	3
16.0	5	42.0	8	67.0	16	92.0	9	[illegible]	15
17.0	12	43.0	12	68.0	6	93.0	9	[illegible]	15
18.0	2	44.0	3	69.0	12	94.0	11	[illegible]	3
20.0	5	45.0	6	70.0	19	95.0	3	[illegible]	15
21.0	5	46.0	6	71.0	20	96.0	11	[illegible]	9
22.0	6	47.0	14	72.0	16	97.0	11	[illegible]	6
23.0	5	48.0	14	73.0	14	98.0	8	[illegible]	9
24.0	6	49.0	5	74.0	9	99.0	9	[illegible]	6
25.0	2	50.0	3	75.0	9	100.0	6		
26.0	14	51.0	2	76.0	8	101.0	5		
27.0	9	52.0	5	77.0	7	102.0	10		
28.0	12	53.0	13	78.0	16	103.0	12		
29.0	12	54.0	8	79.0	24	104.0	2		
30.0	13	55.0	15	80.0	30	105.0	8		
31.0	20	56.0	11	81.0	23	106.0	11		
32.0	18	57.0	12	82.0	18	108.0	6		
33.0	8	58.0	14	83.0	26	109.0	9		
34.0	24	59.0	9	84.0	12	110.0	2		
35.0	11	60.0	17	85.0	8	113.0	21		

STAGE 1 WING 6, TP-H 1011, DTA, ENDOTHERM 1, 12 DEGREE CENTIGRADE RISE/MIN

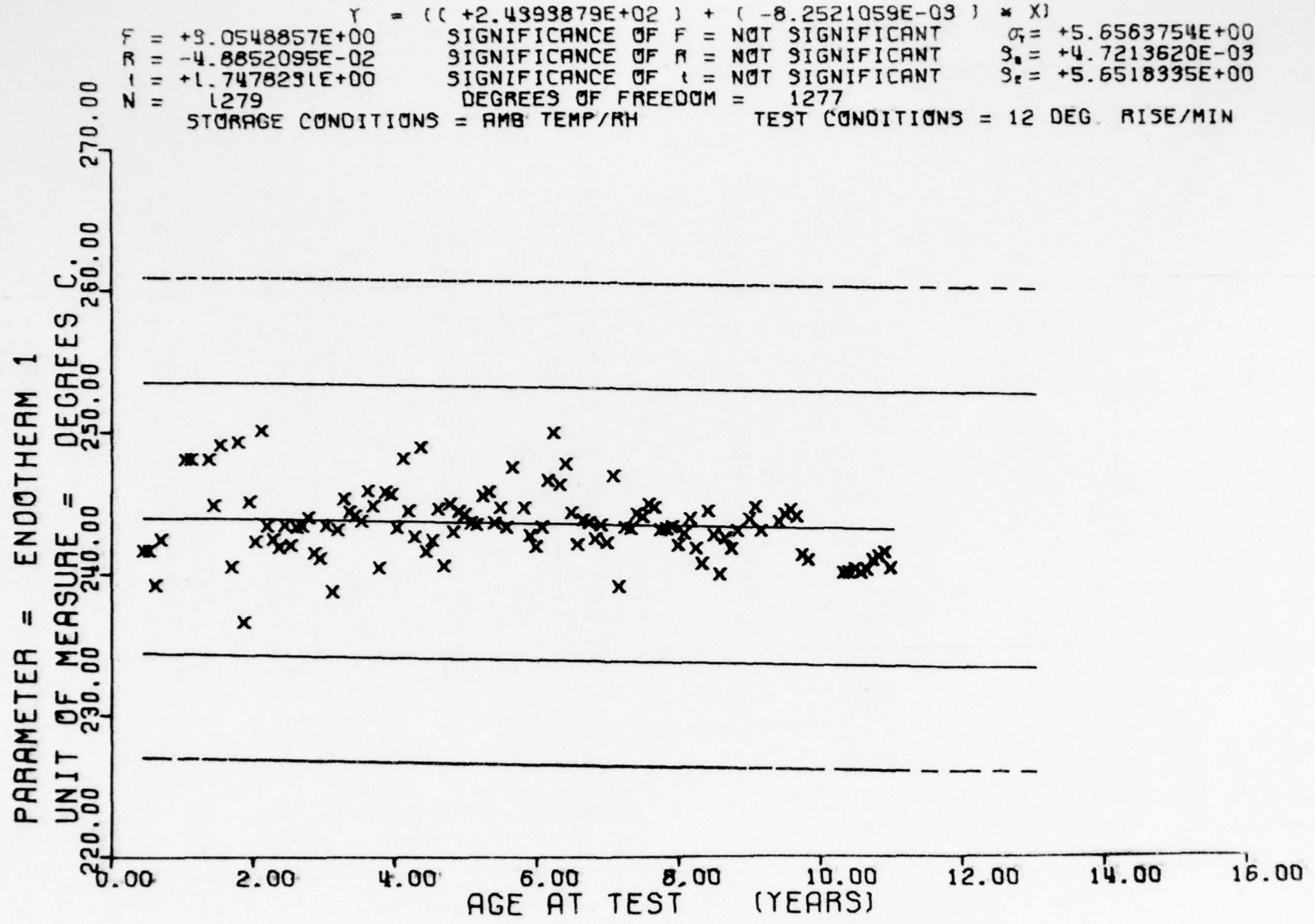
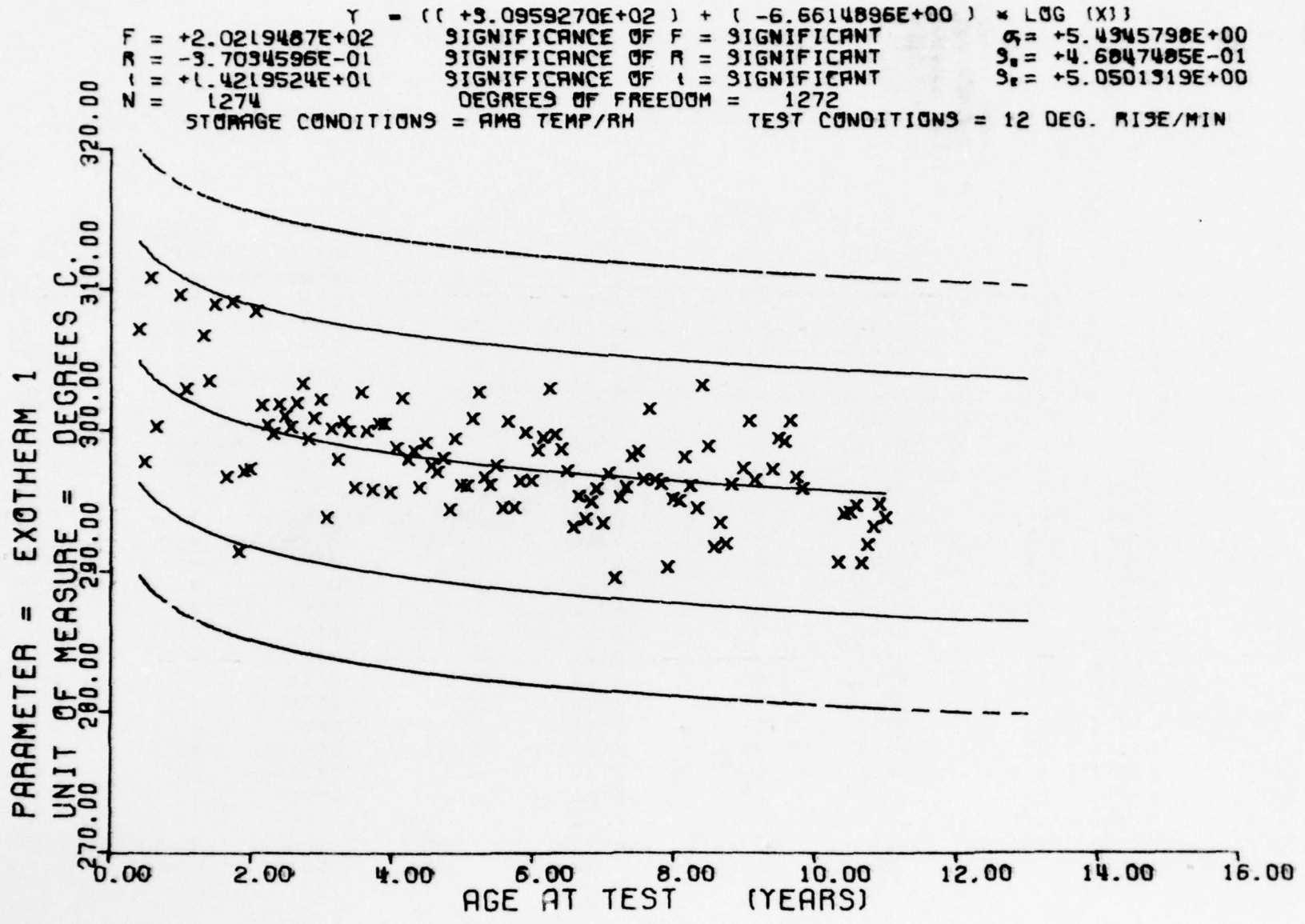

Y = ((+2.4393879E+02) + (-8.2521059E-03) * X)
F = +3.0548857E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +5.6563754E+00
R = -4.8852095E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S = +4.7213620E-03
t = +1.7478231E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S = +5.6518335E+00
N = 1279 DEGREES OF FREEDOM = 1277
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 12 DEG. RISE/MIN
PARAMETER = ENDOTHERM 1
UNIT OF MEASURE = DEGREES C.
270.00
260.00
250.00
240.00
230.00
220.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1 WING 6, TP-H 1011, DTA, ENDOTHERM 1, 12 DEGREE CENTIGRADE RISE/MIN

Figure 73

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
5.0	9	36.0	17	61.0	8	86.0	12	114.0	42
6.0	27	37.0	8	62.0	8	87.0	15	115.0	15
7.0	11	38.0	6	63.0	12	88.0	12	116.0	3
8.0	9	39.0	5	64.0	4	89.0	23	117.0	13
12.0	3	40.0	15	65.0	10	90.0	27	118.0	38
13.0	3	41.0	2	66.0	9	91.0	9	124.0	3
16.0	5	42.0	8	67.0	16	92.0	9	125.0	15
17.0	12	43.0	12	68.0	6	93.0	9	126.0	15
18.0	2	44.0	3	69.0	12	94.0	11	127.0	3
20.0	5	45.0	6	70.0	18	95.0	3	128.0	15
21.0	5	46.0	6	71.0	20	96.0	11	129.0	9
22.0	6	47.0	14	72.0	16	97.0	11	130.0	6
23.0	5	48.0	14	73.0	14	98.0	8	131.0	9
24.0	6	49.0	5	74.0	9	99.0	9	132.0	6
25.0	2	50.0	3	75.0	9	100.0	6		
26.0	14	51.0	2	76.0	8	101.0	5		
27.0	9	52.0	5	77.0	7	102.0	10		
28.0	12	53.0	13	78.0	16	103.0	12		
29.0	12	54.0	7	79.0	24	104.0	2		
30.0	13	55.0	15	80.0	30	105.0	8		
31.0	20	56.0	11	81.0	23	106.0	11		
32.0	18	57.0	12	82.0	18	108.0	6		
33.0	8	58.0	14	83.0	25	109.0	9		
34.0	24	59.0	9	84.0	12	110.0	2		
35.0	11	60.0	16	85.0	8	113.0	21		

STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 1, 12 DEGREE CENTIGRADE RISE/MIN



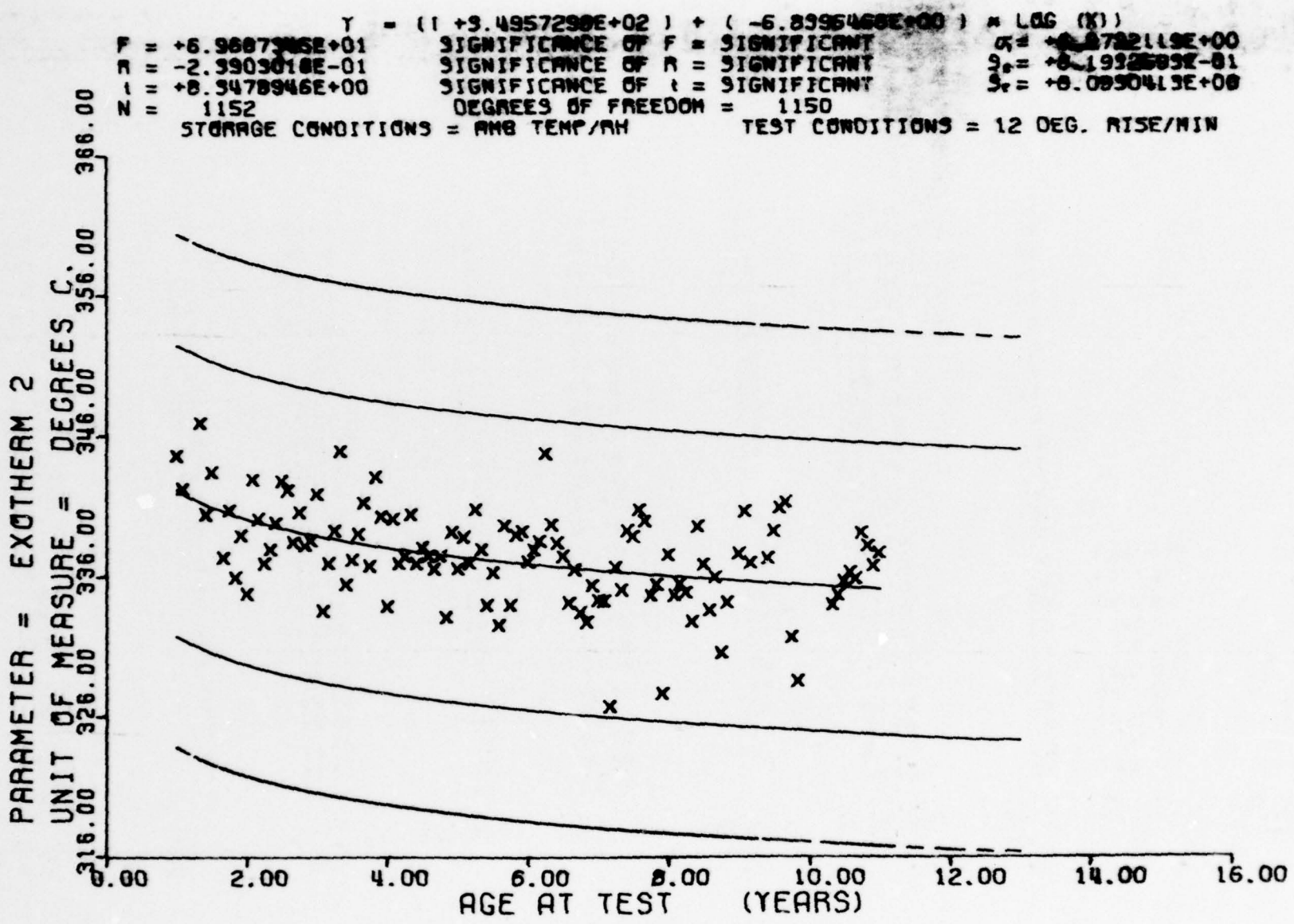
STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 1, 12 DEGREE CENTIGRADE RISE/MIN

Figure 74

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
12.0	3	40.0	13	65.0	9	90.0	26	118.0	38
13.0	3	41.0	2	66.0	9	91.0	9	124.0	7
16.0	5	42.0	8	67.0	10	92.0	9	125.0	15
17.0	12	43.0	10	68.0	6	93.0	9	126.0	14
18.0	2	44.0	3	69.0	12	94.0	11	127.0	3
20.0	5	45.0	6	70.0	12	95.0	3	128.0	13
21.0	5	46.0	6	71.0	20	96.0	10	129.0	8
22.0	6	47.0	14	72.0	14	97.0	10	130.0	6
23.0	5	48.0	14	73.0	14	98.0	8	131.0	9
24.0	6	49.0	5	74.0	9	99.0	9	132.0	6
25.0	2	50.0	3	75.0	9	100.0	6		
26.0	11	51.0	2	76.0	8	101.0	5		
27.0	8	52.0	4	77.0	7	102.0	10		
28.0	6	53.0	11	78.0	15	103.0	11		
29.0	10	54.0	7	79.0	24	104.0	2		
30.0	9	55.0	15	80.0	30	105.0	7		
31.0	13	56.0	10	81.0	23	106.0	11		
32.0	18	57.0	11	82.0	18	108.0	6		
33.0	6	58.0	14	83.0	22	109.0	9		
34.0	20	59.0	9	84.0	12	110.0	2		
35.0	11	60.0	15	85.0	7	113.0	21		
36.0	17	61.0	8	86.0	12	114.0	42		
37.0	8	62.0	8	87.0	15	115.0	15		
38.0	4	63.0	12	88.0	12	116.0	3		
39.0	3	64.0	4	89.0	23	117.0	13		

OF 1 WING 6. TP-H 1011. DTA. EXOTHERM 2. 12 DEGREE CENTIGRADE RISE/MIN



STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 2, 12 DEGREE CENTIGRADE RISE/MIN

Figure 75

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NK SAMPLES	AGE (MONTHS)	NK SAMPLES	AGE (MONTHS)	NK SAMPLES
16.0	1	64.0	2	116.0	1
17.0	3	66.0	2	117.0	1
22.0	1	77.0	1	118.0	2
24.0	1	78.0	3	128.0	2
26.0	2	79.0	18	130.0	2
27.0	1	80.0	12		
28.0	1	81.0	9		
29.0	2	82.0	7		
30.0	2	83.0	8		
31.0	1	84.0	7		
34.0	2	86.0	1		
35.0	2	87.0	6		
37.0	1	88.0	8		
40.0	5	89.0	16		
42.0	3	90.0	12		
46.0	2	91.0	6		
47.0	3	92.0	5		
49.0	1	94.0	2		
53.0	2	96.0	6		
54.0	1	97.0	3		
55.0	1	108.0	3		
57.0	5	109.0	4		
58.0	2	113.0	11		
59.0	6	114.0	21		
60.0	4	115.0	4		

STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 3, 12 DEGREE CENTIGRADE RISE/MIN

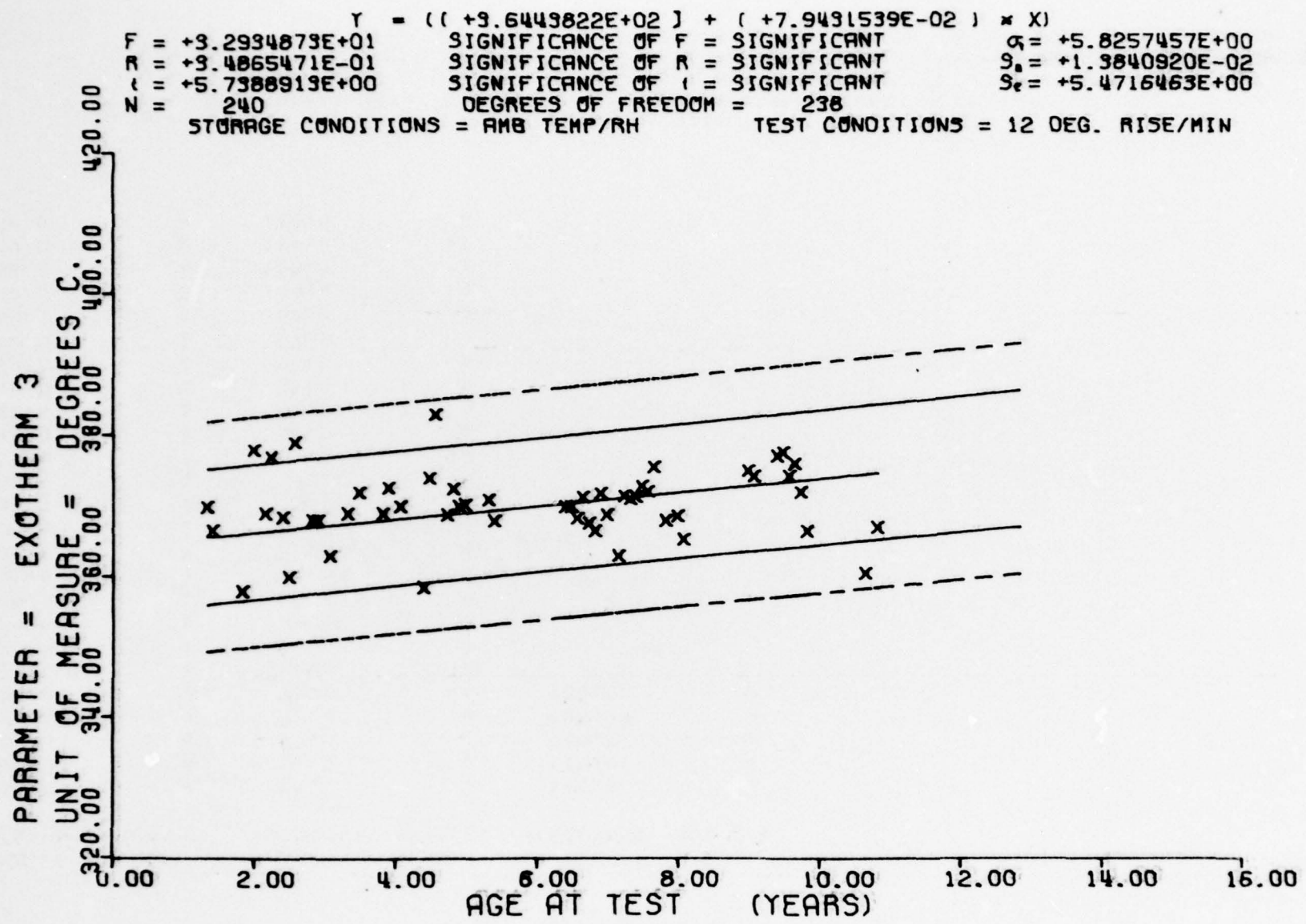
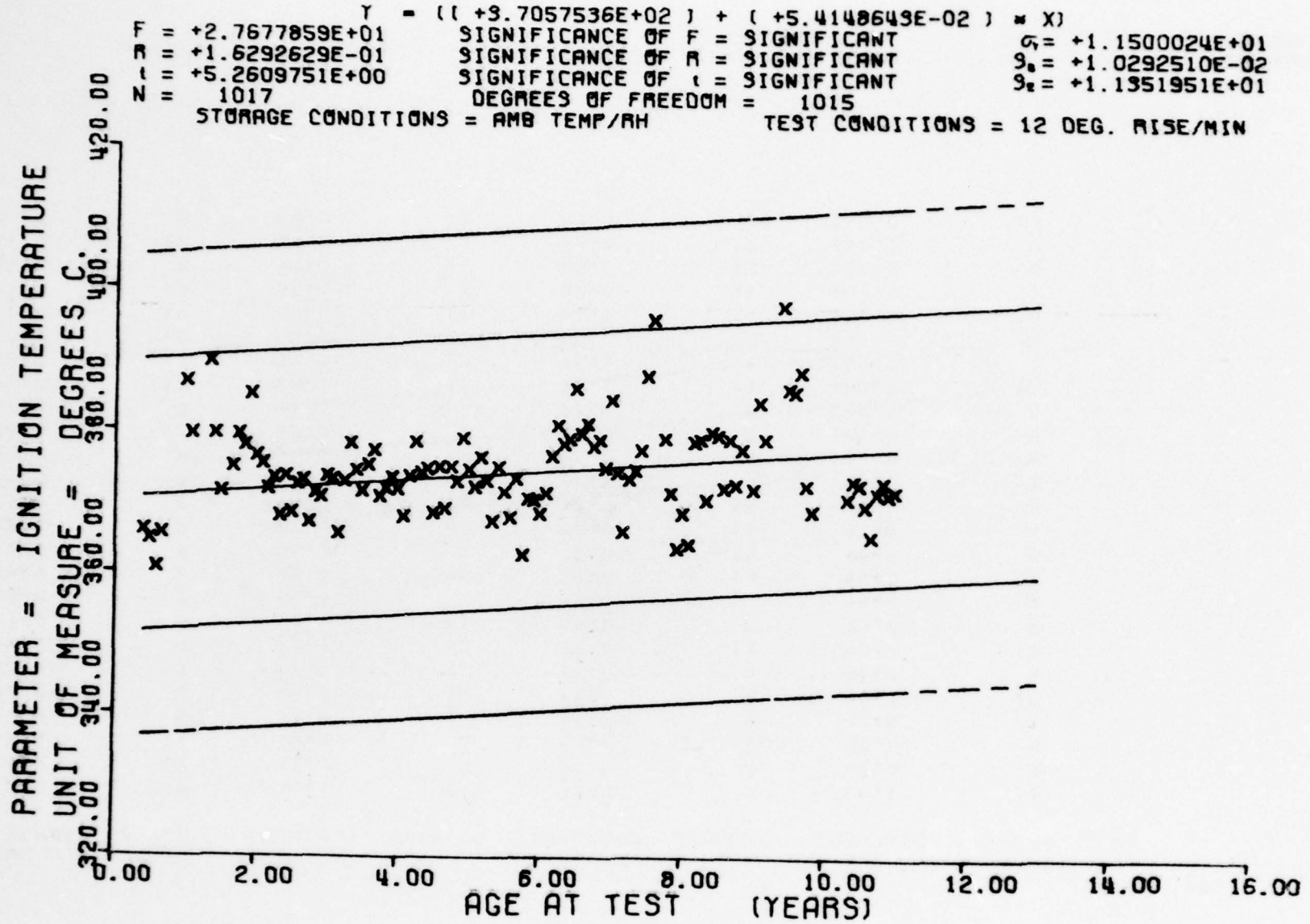

Y = ((+3.6449822E+02) + (+7.9431539E-02) * X)
F = +3.2934873E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +5.8257457E+00
R = +3.4865471E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +1.3840920E-02
t = +5.7388913E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +5.4716463E+00
N = 240 DEGREES OF FREEDOM = 238
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 12 DEG. RISE/MIN
PARAMETER = EXOTHERM 3
UNIT OF MEASURE = DEGREES C.
320.00
340.00
360.00
380.00
400.00
420.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 3, 12 DEGREE CENTIGRADE RISE/MIN

Figure 76

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
5.0	9	36.0	17	61.0	7	86.0	11
6.0	27	37.0	7	62.0	6	87.0	9
7.0	11	38.0	6	63.0	12	88.0	5
8.0	9	39.0	5	64.0	3	89.0	7
12.0	3	40.0	10	65.0	8	90.0	18
13.0	3	41.0	2	66.0	8	91.0	5
16.0	4	42.0	5	67.0	13	92.0	7
17.0	9	43.0	11	68.0	6	93.0	9
18.0	2	44.0	3	69.0	12	94.0	9
20.0	2	45.0	5	70.0	19	95.0	3
21.0	5	46.0	4	71.0	20	96.0	5
22.0	2	47.0	11	72.0	16	97.0	4
23.0	5	48.0	13	73.0	14	98.0	6
24.0	5	49.0	4	74.0	9	99.0	3
25.0	2	50.0	3	75.0	9	100.0	6
26.0	12	51.0	2	76.0	8	101.0	5
27.0	8	52.0	5	77.0	6	102.0	8
28.0	11	53.0	11	78.0	13	103.0	11
29.0	10	54.0	8	79.0	7	104.0	1
30.0	10	55.0	15	80.0	19	105.0	5
31.0	19	56.0	11	81.0	14	106.0	8
32.0	18	57.0	7	82.0	11	108.0	3
33.0	8	58.0	12	83.0	19	109.0	5
34.0	22	59.0	3	84.0	7	110.0	2
35.0	9	60.0	12	85.0	8	113.0	13

STAGE 1 WING 6, TP-H 1011, DTA, IGNITION TEMPERATURE, 12 DEGREE CENT. RISE/MIN



STAGE 1 WING 6, TP-H 1011, OTA, IGNITION TEMPERATURE, 12 DEGREE CENT. RISE/MIN

Figure 77

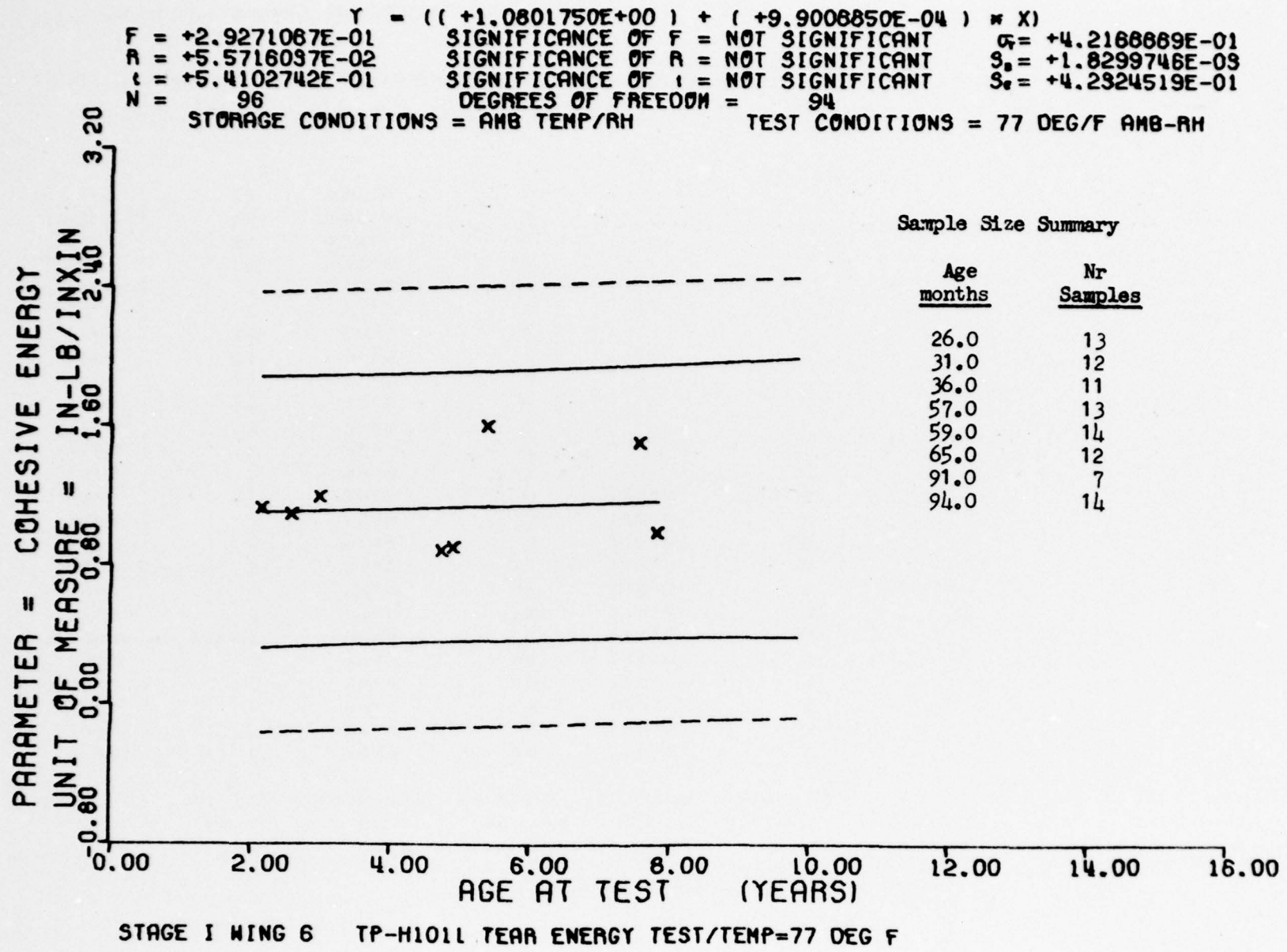

Y = ((+1.0801750E+00) + (+9.9006850E-04) * X)
F = +2.9271087E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +4.2166869E-01
R = +5.5716037E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb = +1.8299746E-03
t = +5.4102742E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT Se = +4.2324519E-01
N = 96 DEGREES OF FREEDOM = 94
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG/F AMB-RH
PARAMETER = COHESIVE ENERGY
UNIT OF MEASURE = IN-LB/INXIN
3.20
2.40
1.60
0.80
0.00
-0.80
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
Sample Size Summary
Age months
Nr Samples
26.0 13
31.0 12
36.0 11
57.0 13
59.0 14
65.0 12
91.0 7
94.0 14
STAGE I WING 6 TP-H1011 TEAR ENERGY TEST/TEMP=77 DEG F

Figure 78

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
28.0	6	71.0	15	104.0	3
30.0	3	75.0	3	105.0	6
32.0	2	76.0	3	107.0	6
34.0	2	78.0	30	108.0	3
35.0	3	79.0	42	110.0	1
36.0	7	80.0	56	111.0	34
37.0	3	81.0	42	112.0	13
39.0	6	82.0	32	113.0	4
41.0	3	83.0	50	118.0	40
42.0	3	84.0	3	119.0	22
48.0	3	86.0	3	120.0	4
52.0	3	88.0	6	122.0	4
53.0	3	90.0	3		
54.0	3	91.0	9		
55.0	3	92.0	5		
59.0	10	93.0	6		
60.0	18	94.0	3		
61.0	21	95.0	3		
62.0	15	96.0	12		
63.0	5	97.0	6		
64.0	3	98.0	12		
66.0	14	99.0	18		
67.0	54	100.0	6		
68.0	78	101.0	3		
69.0	36	102.0	6		

STAGE I WING 6 DIFFERENTIAL SCANNING CALORIMETER ENDOTHERM PEAK TEMP

This sample size summary is applicable for figures 79 thru 81.

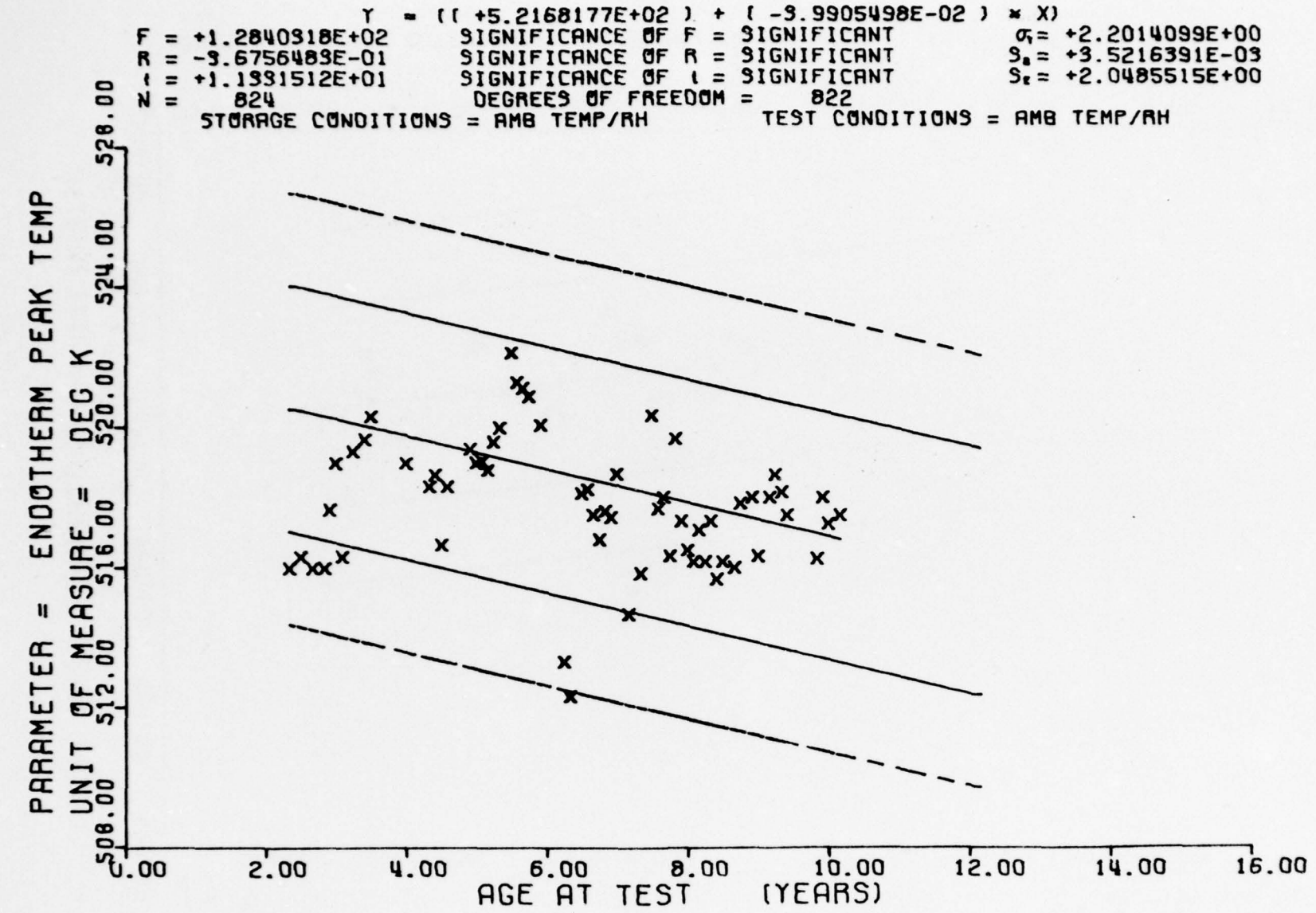

Y = ((+5.2168177E+02) + (-3.9905498E-02) * X)
F = +1.2840318E+02 SIGNIFICANCE OF F = SIGNIFICANT σt = +2.2014099E+00
R = -3.6756483E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +3.5216391E-03
t = +1.1331512E+01 SIGNIFICANCE OF t = SIGNIFICANT Se = +2.0485515E+00
N = 824 DEGREES OF FREEDOM = 822
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = ENDOTHERM PEAK TEMP
UNIT OF MEASURE = DEG K
508.00
512.00
516.00
520.00
524.00
528.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE I WING 6 DIFFERENTIAL SCANNING CALORIMETER ENDOTHERM PEAK TEMP

Figure 79

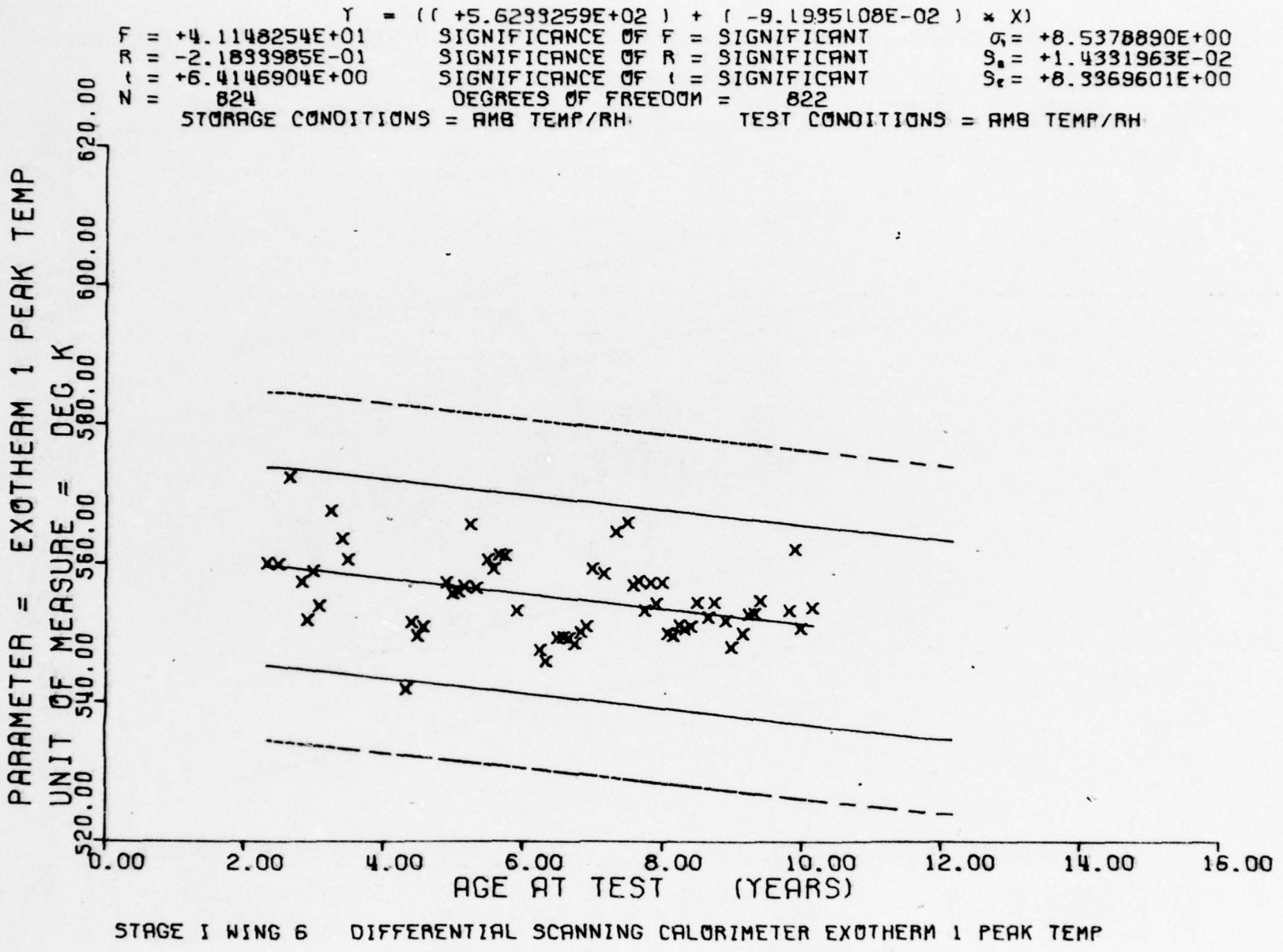
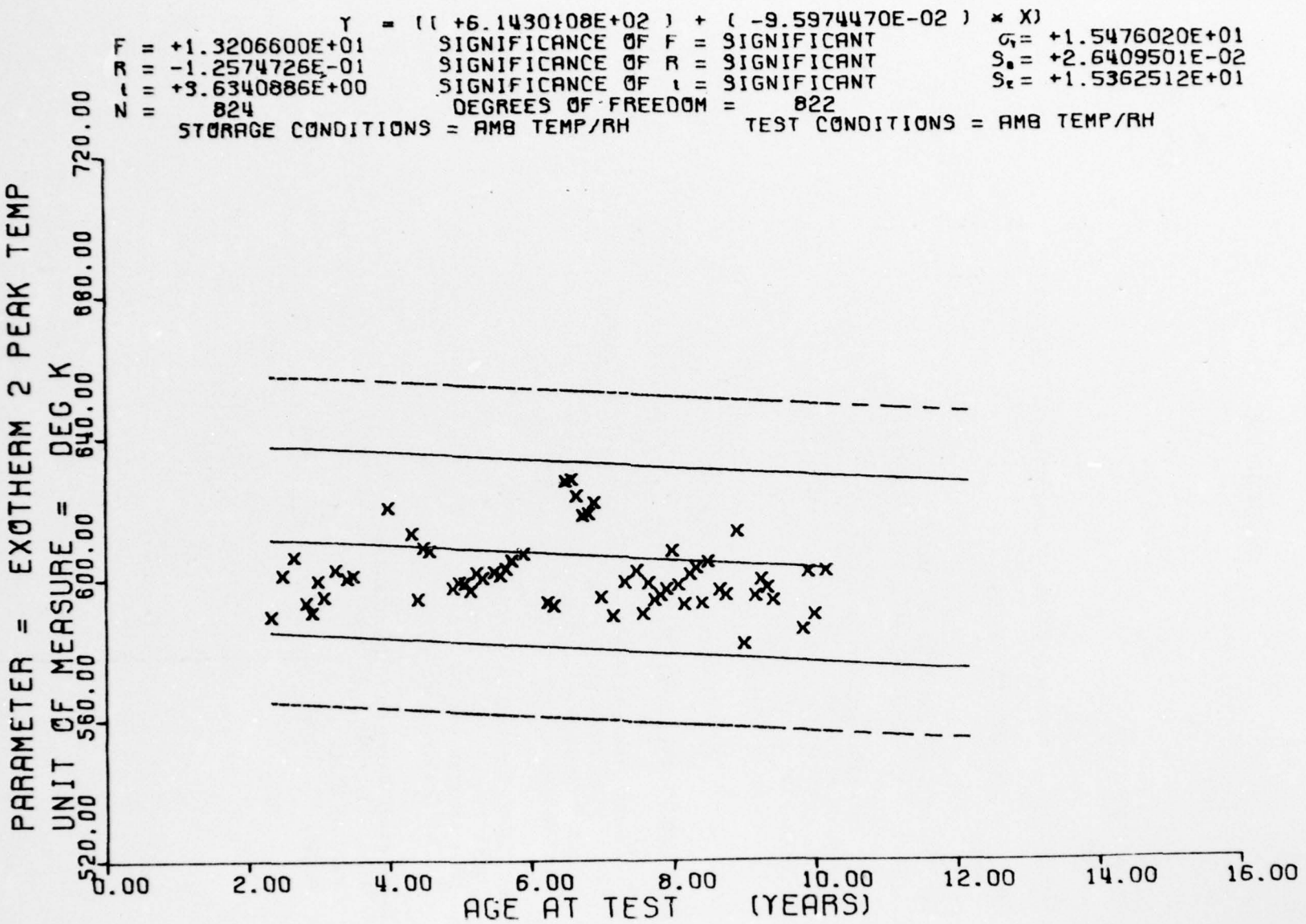

Y = ((+5.6239259E+02) + (-9.1995108E-02) * X)
F = +4.1148254E+01 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +8.5378890E+00
R = -2.1833985E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +1.4331963E-02
t = +6.4146904E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +8.3369601E+00
N = 824 DEGREES OF FREEDOM = 822
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = EXOTHERM 1 PEAK TEMP
UNIT OF MEASURE = DEG K
520.00
540.00
560.00
580.00
600.00
620.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE I WING 6 DIFFERENTIAL SCANNING CALORIMETER EXOTHERM 1 PEAK TEMP

Figure 80



STAGE I WING 6 DIFFERENTIAL SCANNING CALORIMETER EXOTHERM 2 PEAK TEMP

Figure 81

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4. TITLE *(and Subtitle)*: (6) Propellant Surveillance Report LGM-30 F & G Stage 1, Phase E, Series II, TP-H1011, and	5. TYPE OF REPORT & PERIOD COVERED: Test Results - Semi-annual
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): (10) John A. Thompson	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Propellant Lab Section, Directorate of Maintenance, OO/ALC Hill AFB, Utah 84406	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: MMEMP Project M72632-5MP116P
11. CONTROLLING OFFICE NAME AND ADDRESS: Service Engineering Division, Directorate of Material Management, OO/ALC Hill AFB, Utah 84406	12. REPORT DATE: (11) Oct[illegible] 1976
	13. NUMBER OF PAGES: 137 (12) 138p.
14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*	15. SECURITY CLASS. *(of this report)*: Unclassified
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Solid Propellant
Minuteman

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This report contains propellant test results from cartons of TP-H1011 bulk propellant representing LGM-30 F and G First Stage Minuteman Motors. This report uses a statistical approach to analyze the bulk carton propellant data. Testing was accomplished in accordance with MMEMP Project M72632-5MP116P.

The data from this test period are combined with data from previous →

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testing and entered into the G085 computer for storage, analysis and regression analysis. From the statistical analysis of all data tested to date (11 and one half years for F and G), significant degradation of the propellant does not appear likely for at least two years past the oldest data point.

Each point on the regression plot represents the mean of all samples at that particular age. The number of samples at each point is indicated on the sample size summary sheet on the page accompanying each regression plot or group of regression plots. The data range at any age can be found by suitable inquiry of the G085 system.